

architectural
& engineering

NEWS

MAY 1960 VOLUME 2 NUMBER 5

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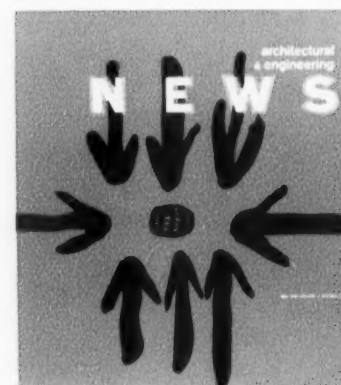
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BPA



This month's issue highlights concrete. Tony Palladino's cover abstractly furnishes a rudimentary example of pre-stressing theory applied to a wooden barrel. The staves are pre-compressed and the metal bands are pre-tensioned. The vertical arrows illustrate the direction of the stave compression and the horizontal arrows the applied direction of the bands.

5

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57 Editorial: Dr. Oppenheimer comments

4 Forecast: construction outlook

8 A museum in concrete for Utica

13 Concrete/the year past

19 In-place concrete strength test

22 Engineer shortage and testing procedures

24 IBEC's comparative concrete techniques

2 Gazette

5 A/E news

25 Products, equipment, materials

40 Literature

52 Preview: 17/Diamond Canyon Restaurant

53 Digest: 17/Insulating lightweight aggregate

54 Books: building products register

56 Names: Emanuel N. Turano, AIA

59 Calendar

58 Index to advertisers

**Readers service cards
facing pages 1 and 58**

GAZETTE

Harold Hauf, AIA, Dean, School of Architecture, Rensselaer Polytechnic Institute, Troy, N. Y., appointed member of Board of Governors, *Building Research Institute, National Research Council*.

Harry E. Rodman, AIA, professor, School of Architecture, Rensselaer Polytechnic Institute, Troy, N. Y., re-appointed as member of New York State Board of Examiners of Architects.

Edmund Turiello and Henry J. Euler, Jr., appointed temporary chairman and temporary recorder, respectively, of Massachusetts Council, Society of American Registered Architects, Inc.

Ernest H. Lichtblau, Viennese Architect and Designer and former professor at Rhode Island School of Design, presented honorary membership in *National Society of Interior Designers*.

Alfred W. Maner appointed Headquarters Staff Engineer at *The Asphalt Institute*, College Park, Md.

Henry Kleinkauf named executive chairman of board of directors, and Henry Gould named president and treasurer of *Natkin & Co.*, mechanical contracting firm of Omaha, Nebr.

Burns and Roe, Inc., architect-engineering firm of New York, has established Burns and Roe Western Hemisphere Corp. as a subsidiary, incorporated under laws of State of Delaware.

H. K. Siefers, Jr., a graduate of Carnegie Institute of Technology with degree in chemical engineering, appointed manager of Engineering Service Dept. of A. M. Byers Co., Pittsburgh.

James G. Gross, PE, named assistant director of Engineering and Technology for *Structural Clay Products Institute*, Washington, D. C.

James I. Maguire, Victor W. Anckaitis, PE, and Robert E. Hartmann, appointed director of management services, director of property management and controller, respectively, by Alpha Portland Cement Co., Easton, Pa.

Robert R. Wagstaff, PE, elected engineering vice president and director of United Engineers & Constructors, Inc., Philadelphia.

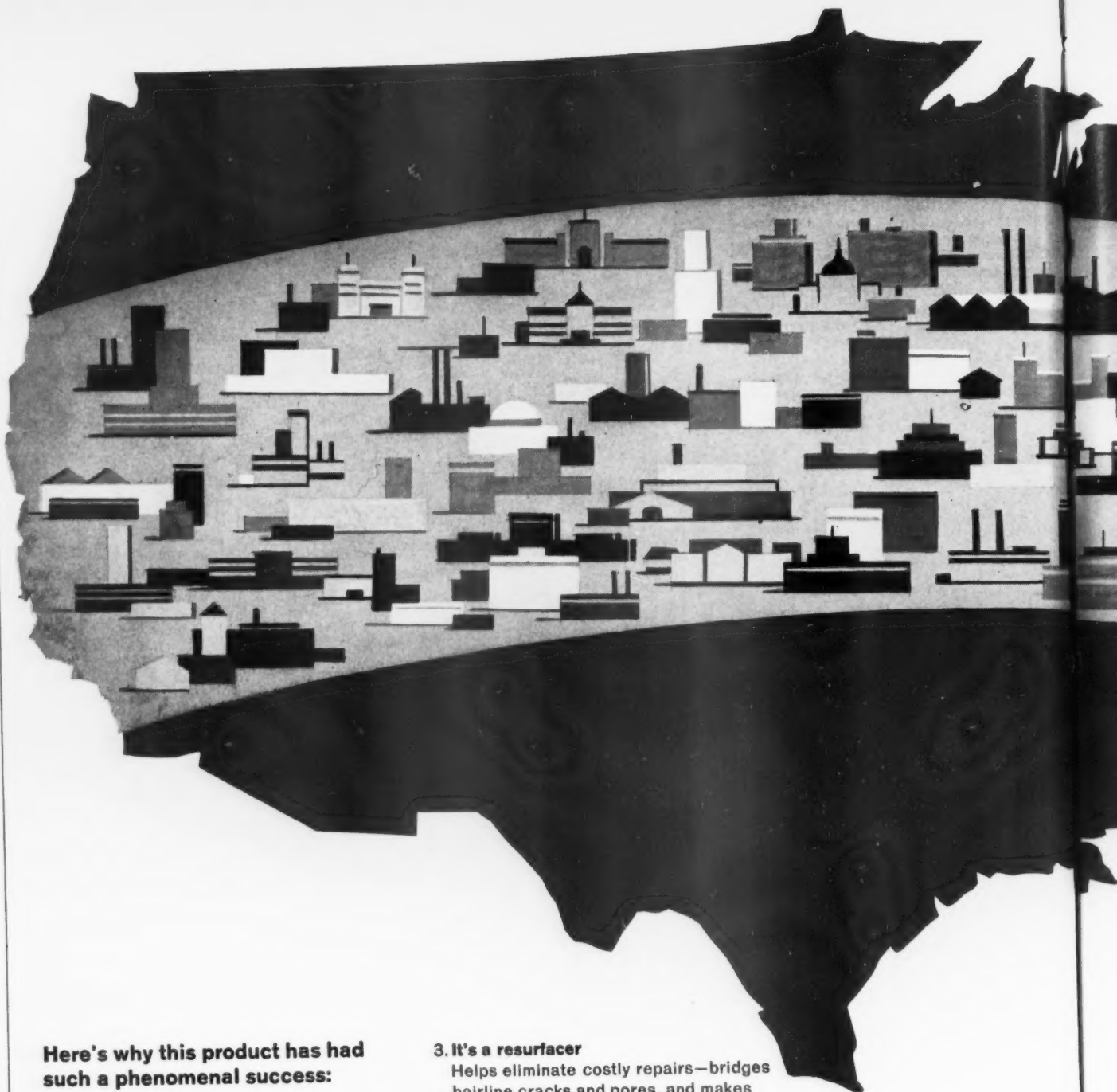
Augustin L. Queneau, metallurgical consultant, named 1960 recipient of Egleston Medal, Columbia University's highest award for "distinguished engineering achievement."

Robert F. Loftus, Public Relations Director of *National Assn. of Home Builders*, resigned March 25.

Kenneth A. Smith, AIA, appointed architectural engineer for Spector Freight System, Inc., Chicago.

John B. Kelley, PE, appointed assistant to the executive vice-president of Burns and Roe, Inc., New York City engineers and constructors.

Retirement of E. Lawrence Chandler as assistant secretary of *American Society*



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stretching from coast to coast
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GAZETTE

of Civil Engineers announced; he will continue to hold post of treasurer. He has also been selected as first recipient of recently established *ASCE Professional Recognition Award*, presented to member judged to have contributed substantially to the status of the engineering profession.

Daniel P. Higgins, Jr., of Eggers & Higgins, Architects, New York City, appointed chairman of Architects & Engineers division, 1960 Fund Appeal of New York Catholic Charities.

Robert W. Boltz appointed technical secretary of *Acoustical Materials Assn.*, New York.

Richard B. Taylor promoted to administrative supervisor in mechanics research at *Armour Research Foundation* of Illinois Institute of Technology.

Southern California Chapter of *American Institute of Architects* announces following awards: recipients of certificates of craftsmanship for outstanding skill in executing an architect's special design in basic and finish trades—Tom Van Sant of Smith, Powell & Morgridge, architects; Perli Pelzig of Scandinavian Art Metals; and Ernest Friedman of Standard Cabinet Works, Inc.; recipients of certificates of draftmanship for outstanding work in design communication—Tom Woo of Smith, Powell & Morgridge; Robert Edmiston of H. L. Gogerty architectural firm; and George Nelson of Welton Becket & Associates, architects. Awards of merit for outstanding craftsmanship in the fine arts presented to the Roger Darricarrere Studio and Bernard Rosenthal.

George L. Willox, AIA, appointed to State Planning Commission by Governor Edmund G. Brown of California.

Robert W. Cutler, AIA, partner of Skidmore, Owings & Merrill, New York architectural firm, elected president of The Architectural League of New York.

Hugh W. Brown, III, awarded LeBrun fellowship of \$3,000 for six months of travel in Europe, by New York Chapter, *American Institute of Architects*.

Robert W. Hegardt, AIA, has joined firm of Ballard, Todd & Snibbe, New York.

Ralph R. Rumer, Jr., graduate student at Massachusetts Institute of Technology, awarded \$5,000 research fellowship for 1960 by *American Society of Civil Engineers*. Award will be used to pursue analytical and experimental investigation of diffusion and gravitational convection in liquids of different density in material.

Office announcements

John M. Kokkins, Architect, to 420 Lexington Ave., New York, N. Y.

Franklyn I. Geiffert, Architect, to Main St., Armonk, N. Y.

Edwin J. Dauber, Architect, to 70 Middle Neck Rd., Great Neck, L. I.

Formation announced of Lyras, Galvin & Anaya, architectural firm, 111 East 38th St., New York, N. Y.

Openings

Showroom opened at 1 Park Ave., New York, N. Y., by The Frederic Weinberg Co., Philadelphia, Pa.

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FORECAST

CONSTRUCTION OUTLOOK: FIRST THREE MONTHS OF 1960*

The value of new construction put-in-place in March 1960 amounted to \$3.7 billion, according to preliminary estimates of the Bureau of the Census, U. S. Department of Commerce. This was 5 per cent above the February 1960 level and 4 per cent below the March 1959 value. Seasonal expectations call for an increase of about 8 per cent between February and March. The cumulative value of construction expenditures in the first three months of 1960 amounted to \$10.9 billion, 2 per cent below the comparable 1959 total.

Private construction

New private construction expenditures in March 1960 amounted to \$2.7 billion, 4 per cent more than in February 1960 and about the same level as in March 1959. The February to March increase in private construction was also less than the expected seasonal rise for that period. Consequently, the seasonally adjusted annual rate of private construction declined in March by 3 per cent, with private residential building accounting for the major portion of this decrease. Spending for private residential construction in March 1960 amounted to \$1.4 billion. This was 6 per cent more than in February, compared to a normal seasonal increase of about 10 per cent between February and March. Private nonresidential building expenditures declined in March by 2 per cent to \$0.75 billion, compared to an expected seasonal rise of about 1 per cent from February to March.

The cumulative value of private construction expenditures in the first three months of 1960 amounted to \$8.0 billion, 3 per cent above the total for the comparable period in 1959. The cumulative value of expenditures for residential buildings in the first three months of 1960 showed an over-the-year decline of 3 per cent to \$4.3 billion. However, increases in expenditures for all other types of private construction more than offset this decline in residential expenditures.

Public construction

Public construction expenditures in March 1960 amounted to \$1.0 billion, 8 per cent more than in February 1960, but 14 per cent below the March 1959 level. The February to March change was less than the normal seasonal increase for that period. Highway expenditures in March showed a normal seasonal rise and remained at an annual rate of approximately \$5.8 billion. Expenditures for nearly all other types of public construction increased in March but by less than the normal seasonal change between February and March.

In the first three months of 1960, cumulative expenditures for public construction were 14 per cent less than in the same period in 1959. The major types of public construction—highways and educational buildings—shared in this over-the-year decline with the balance of the types about equally divided between increases and decreases.

Patterns and factors

Except when special surveys are undertaken, as was done during the 1959 steel strike to obtain some information about the effect of steel shortages on construction work done, these monthly estimates are not based on direct measurements. Primarily, they are derived by applying standard progress patterns (which reflect normal seasonal movements) to the value of contracts awarded prior to the current month. The estimates do not reflect the effects of the varying number of working days in each month, nor of special conditions influencing the volume of activity in any given month, such as unusual weather, overtime, postponements, and, except when special surveys are made, materials shortages and work stoppages.



* Based on "Construction Reports," U. S. Department of Commerce, Washington, D. C.

NEW CONSTRUCTION PUT IN PLACE IN
CONTINENTAL UNITED STATES
FIRST THREE MONTHS OF 1960 COMPARED WITH 1959*

PRIVATE CONSTRUCTION

1959 (3 mos.)		\$ 7,770	
1960 (3 mos.)		\$ 8,014	+ 3% (59/60)

PUBLIC CONSTRUCTION

1959 (3 mos.)		\$ 3,288	
1960 (3 mos.)		\$ 2,840	-14% (59/60)

TOTAL NEW CONSTRUCTION

1959 (3 mos.)		\$11,058	
1960 (3 mos.)		\$10,854	- 2% (59/60)

*COMPARISONS GIVEN IN MILLIONS—CONSTRUCTION ACTIVITY
REPORTS OF U. S. DEPARTMENT OF COMMERCE, WASHINGTON, D. C.



Group picture of the 1960 AIA Fellows, taken at the impressive ceremonies of Investiture of The College of Fellows, held April 19, 1960, in the Rotunda of San Francisco's famed City Hall.

AIA portfolio

As we go to press with this May issue, the 1960 convention of *The American Institute of Architects* is in session at San Francisco. Previous issues have carried advance news of the convention. Our June issue will contain a summary of the annual meeting.

A recent conference on the coordination of architectural education, accrediting and licensing was held at the Octagon in Washington, D.C., national headquarters of the AIA.

Conference participants were: Leonard Wolf, AIA, Secretary, Assn. of Collegiate Schools of Architecture; Harlan E. McClure, AIA, President, ACSA; Walter A. Taylor, FAIA, Head of Education, AIA; Theodore W. Dominick, AIA, Director, Member Services, AIA; Edmund R. Purves, FAIA, Executive Director, AIA; John Noble Richards, FAIA, President, AIA; Hari Von Hoefen, AIA, President, National Architectural Accrediting Board; Elliot Whitaker, AIA, Secretary, NAAB; Walter F. Martens, FAIA, President National Council of Architectural Registration Boards, and A. Reinhold Melander, AIA, Vice-President, NCARB.

"We had a most interesting and frank exchange of differing viewpoints and approaches to the problems of strengthening the professional competence of the architect," said John Noble Richards, FAIA, of Toledo, Ohio. The AIA president added, "The meeting will result in closer cooperation between our organizations and its impact is sure to be felt in the near future."

On a recent visit to Mexico to address the Mexican Society of Architects, AIA President Richards, was

made a member of the Mexican Society of Architects and was received by Adolfo Lopez Mateos, President of Mexico.

U.S. architects Henry S. Churchill, FAIA, of Philadelphia, Pa., Leon Chatalein, Jr., FAIA, of Washington, D.C., and Glenn Stanton, FAIA, of Portland, Ore., were also made members of the Mexican Society. At a reception at the National Palace in Mexico City, Richards presented the President of Mexico with a glass key to the city of Toledo, Ohio.

West Coast report

The master plan for the new "town center" of Santa Fe Springs which, when completed, will represent the first community development of its kind in the United States, was approved by the town's city council after presentation by *William L. Pereira, FAIA*, whose Los Angeles planning and architectural firm has been commissioned to design the unique project. Incorporating not only a civic center but medical, commercial, financial and residential facilities as well, the town center may eventually occupy a site of more than twenty acres. Among the facilities planned are: new city administrative offices, a library and a multi-purpose meeting room, judicial and police units. The commercial center will provide shops, restaurants, motels, a theatre and related recreational facilities. The entire site will be elaborately landscaped with tree-lined promenades and malls.

The Pereira firm has also been commissioned to design the new Los Angeles County Museum of Art. Consisting of three units—a gallery, special exhibition area and an auditorium—the entire facility will be built at an approximate cost of \$3.5 million.

The Supplies Division of International Business Machines Corp. has awarded the construction contract for its new card manufacturing plant in Campbell, Calif. The 70,000 square foot facility, to be built on a 20-acre site, was designed by *Charles Luckman Associates* of Los Angeles. Present plans call for occupancy late in 1960.

The master plan for the new \$5 million Sherwood Manor regional shopping center in Stockton, Calif., has been approved by the City Planning Commission. Construction on the first phase of the development, estimated to cost \$2.2 million, is scheduled to begin within 30 days. *Welton Becket and Associates*, Los Angeles, San Francisco and New York architectural and engineering firm, have been engaged to

design the center. A total of 30 firms will be tenants in the first phase of construction. The second phase will increase the firm total to 55. Parking will be provided for over 2,800 automobiles.

Project roundup

New York University recently dedicated Nichols Hall, the new ten-story home of its Graduate School of Business Administration. The building, located at 100 Trinity Place, is just two doors from the American Stock Exchange. The new air-conditioned, educational facility includes a two-story library, a bookstore, an executive dining room, a 500 seat auditorium, a lounge, classrooms and administrative offices. Architects for the project are *Skidmore, Owings and Merrill*. New York University also announced plans to construct two nine-story residence halls for men and women students, at its Washington Square Center. The buildings, to be built at a cost of more than \$4 million, will feature materials that will reflect the traditional Greek-revival character of Washington Square. Architects for the project are *Harrison and Abramovitz* of New York.

Ground was recently broken for a new \$2.9 million student union building at Illinois Institute of Technology. The two-story glass and steel structure will conform to the general architectural character of the buildings on the IIT campus. A special feature will be in the use of glass that is transparent at night and opaque during the day. Facilities will include a 900-seat auditorium, a ballroom, bowling alleys, music rooms, a student lounge, kitchen and dining facilities. Architects for the project are *Skidmore, Owings and Merrill*.

Swarthmore College in Pennsylvania recently dedicated its new \$1.8 million Pierre S. du Pont Science Building, which under its roof, will house the departments of chemistry, mathematics and physics. The plan features four distinct units around a central open court. Offices, laboratories, the engineering library and a 200-seat lecture hall are included in the facilities. Architect for the project is *Vincent G. Kling, FAIA*, of Philadelphia.

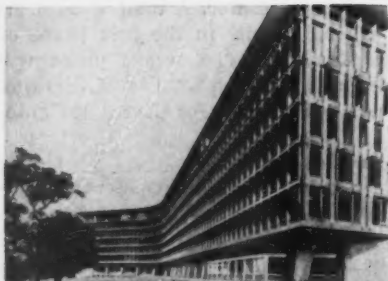
Harland Bartholomew and Associates of Honolulu have been engaged as campus planning consultants for the East-West Center at the University of Hawaii by the project's principal architects, *McAuliffe, Young and As-*

(Continued on page 6)

A/E NEWS



Ludwig Mies van der Rohe, FAIA, 1960 Gold Medalist of The American Institute of Architects, accepts his award from President John Noble Richards, FAIA, at the annual dinner of the AIA convention at San Francisco, April 21, 1960.



Nestle's International Headquarters Building, Vevey, Switzerland, winner of 1960 Reynolds Memorial Award of \$25,000. Seven-story, "Y" shaped structure, by Jean Tschumi, Swiss architect and professor of architecture at University of Lausanne, was jury's unanimous choice for "sensitive use of aluminum in a previously little explored manner."

A/E NEWS

(Continued from page 5)

sociates, Architects of Honolulu, associated with I. M. Pei and Associates, Architects of New York City. The purpose of the new East-West Center is to develop and strengthen mutual understanding among Pacific Area countries. Courses and research facilities to support this aim will be offered at the new university facility. The program of the East-West Center has been endorsed by the U.S. State Department.

A 200 by 165 foot-plot of land, near Grand Central Station in New York City has been bought at a cost of \$9 million by Reynolds and Fuller of New York. A new proposed 37-story office building will be erected on the site at a cost of more than \$25 million. This plot of land is considered in realty circles as one of the first five most valuable corners in the entire nation. Architects for the new project are Kahn and Jacobs of New York.

George Earl Ross, Architect, of Braintree, Mass., has been retained to design the S. Gunnar Myrbeck and Co.'s new office building near Boston.



Rendering of proposed American School (El Colegio Americano) in Guatemala City, Guatemala. Sponsored jointly by U.S. government, the Guatemalan Ministry of Education and private sources, the installation is intended as 1000 pupil, bi-lingual, laboratory, elementary and secondary school. Design consists of single story, multi-bayed series of corridorless buildings, grouped around landscaped courts; bays are roofed by reinforced concrete hyperbolic paraboloids. Architects: Sherwood, Mills and Smith, Stamford, Conn.

Sverdrup and Parcel Engineering Co., Engineer-Architects of St. Louis, have been commissioned to design the new \$5 million modernization and expansion facility of the Mueller Co. of Decatur, Ill. The new construction will add 261,500 square feet of floor space and 43,300 square feet of rehabilitated space. Five new substations located throughout the plant will reduce the 4,160-volt distribution current to the required voltage for specific areas and processes.

An architectural prototype horticultural supermarket center, reputed to be the largest of its kind in the world, has been designed by Lathrop Douglass, FAIA, Architect of New York City. The new facility, located at Menlo Park in New Jersey, is known as Arcadian Gardens. Enclosed under almost an acre of glass, the facility features pools, fountains and is entirely air-conditioned for its 42,000 square feet of selling space.

BRI spring conference

At its meeting in New York on April 4, the Board of Governors of the Building Research Institute, National Academy of Sciences—National Research Council, announced the establishment of a new Building Science Education Fund, to be used for the stimulation of a program for encouraging highly creative people to pursue building research activities in colleges and universities. Impetus for the establishment of the fund came from requests by the BRI Education Liaison Committee under the chairmanship of Harold D. Hauf, AIA, Dean, School of Architecture, Rensselaer Polytechnic Institute at Troy, N. Y. Members of this committee have been working closely during the past year with college and university faculty members, in an effort to interest them more actively in research for buildings. Through the work of this committee, a number of BRI technical reports have been placed in the architectural and engineering libraries and in the hands of faculty members in near 350 schools of architecture, civil and mechanical engineering. A number of schools have started using these reports on building research and development as classroom textbooks.

The BRI spring conference held this past month in New York presented the newest developments in the design, construction, operation and maintenance of buildings.

Topics for discussion by nearly 100 speakers and 70 panel discussion members were new techniques in the ap-

plication of paintings and coatings; latest information on the cleaning and purification of air in homes, office buildings, hospitals and factories; new trends in the use of adhesives for dry-wall construction and for structural lamination; current progress in modern techniques in the construction of insulated masonry cavity walls. Highlight of the second day of the meetings was the first annual presentation of the F. Stuart Fitzpatrick Memorial Award to Norman P. Mason, Administrator, Housing and Home Finance Agency. The award, sponsored by five building industry organizations, is given in honor of "individual contribution to the unification of the various elements of the industry." Sponsors are the Building Research Institute, The National Assn. of Home Builders, The Producers' Council, The American Institute of Architects and the Associated General Contractors of America. Presentation of the award was during the course of a special luncheon in the Grand Ballroom of the Statler-Hilton.

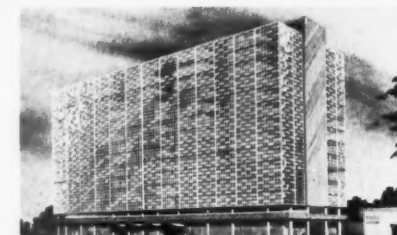
NSPE/ACI/AIEE news

The Board of Directors of the National Society of Professional Engineers, at the recent NSPE Wichita meeting, adopted significant policy statements concerning collective bargaining by engineers and engineering technicians, and the professional provisions of labor legislation. The policy statements point out that past experience and experimentation have shown that the principles of unionism and professionalism conflict to an extent making unionization of professionals inconsistent with the best interests of either the profession or the general public. Professional provisions of labor legislation should be governed by the following considerations: (1) no professional employee should be forced to join a labor union against his will; (2) professionals should retain the right to separate votes in collective bargaining determinations; (3) professionals should be able to vote separately in decertification proceedings; and (4) the right to form non-bargaining associations with other professionals in the same employment should be guaranteed. The new policy statement also favors amendment of the present labor law to prohibit "union" or "agency" shop requirements for professional employees.

Two meetings of the New York Section, American Institute of Electrical Engineers were devoted to the subject of illumination, with particular em-



Rendering of world headquarters of Signal Oil and Gas Co., Los Angeles, Calif., scheduled for completion in mid 1960. Cost of the 16-story office structure is in excess of \$5 million. Architects: Charles Luckman and Associates.



Architect's rendering of plan for motor hotels for Skyhost, Inc., Dallas, Tex. Design features walls of pre-cast concrete. Cost of 12-story units will be approximately \$10,000 each; over 100 units are projected during next five years. Guest will be registered while in one of two auto-passenger elevators which deliver guest, car and luggage directly to his suite, eliminating bellmen, parking garage attendants and elevator operators. Architects and Engineers: Williford & O'Neal, Dallas, Tex.



Rendering of one of three high schools, scheduled for 1961 completion, for Dallas-Fort Worth Catholic Diocese. Co-educational unit will accommodate 900 pupils; is situated on 22½ acre site in East Dallas. Architects: Grayson Gill, Inc., of Dallas, Tex.



Master plan for \$2 million civic center project, located on 20 acre site in Newark, Calif. Scheme includes city hall, library-museum, auditorium, police facility building and additional public buildings. All structures will feature folded plate roofs for purposes of harmony and acoustics. Architects: Welton Becket & Associates, Architects & Engineers, of Los Angeles, New York and San Francisco.

phasis given to a new concept of television studio lighting control by a solid-state device. The meetings were held in Studio 72 of The American Broadcasting Co. in New York City. The heart of the system is a radically new semi-conductor dimmer utilizing controlled rectifiers. Each lighting fixture, up to 300 in a studio, is equipped with one of these dimmers. A console in the studio control room provides simultaneous independent manual control of all circuits, pre-settable group mastering or from a punched card pre-set system. The Illumination Division of the Section heard discussions of lighting design by Robert Jacobs of Kahn and Jacobs, Architects, and John Plantinga of Meyer, Strong and Jones, Consulting Engineers.

Eleven engineers received the 1959 *American Concrete Institute* award in ceremonies highlighting the ACI's 56th annual convention held at the Hotel Commodore in New York City. Winner of the *Turner Medal* was Harrison F. Gonnerman, Oak Park, Ill. The *Lindau Plaque* was presented to Arthur R. Lord, Palos Park, Ill. The *Kennedy Scroll* was awarded to Harry C. Delzell, Chicago. Two University of California faculty members, Boris Bresler and K. S. Pister, collaborated to win the *Wason Medal for Research*. In another team effort, five authors pooled their talents to win the *Wason Medal for Most Meritorious Paper*. They are James E. Backstrom, Richard W. Burrows, and Harry L. Flack, Denver; Richard C. Mielenz, Cleveland; and Vladimir E. Wolkodoff, Niagara Falls, N.Y. Rounding out the award winners is J. F. Camellerie, New York, who was presented with the *Construction Practice Award*.

IVA good will mission

A "good-will" mission tour of four countries of South America for 17 days from August 12 through August 30 was announced in last month's issue of A/E NEWS. The specially coordinated tour, limited to 15 architect-participants (including wives) will be feted in key cities by government officials, professionals and business leaders. It will receive extensive newspaper, radio and television coverage in South America. David W. MacCurdy of the New York architectural firm of Voorhees Walker Smith Smith and Haines will be chairman of the group. Details of this most unusual tour may be had by writing to the Inter-American Visitors Assn., Inc., 15 West 46th St., New York 36, New York.



PROFILE ACOUSTONE—12" x 12" tiles are now produced with two kerf planes. Design possibilities are unlimited.

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UNITED STATES GYPSUM

the greatest name in building

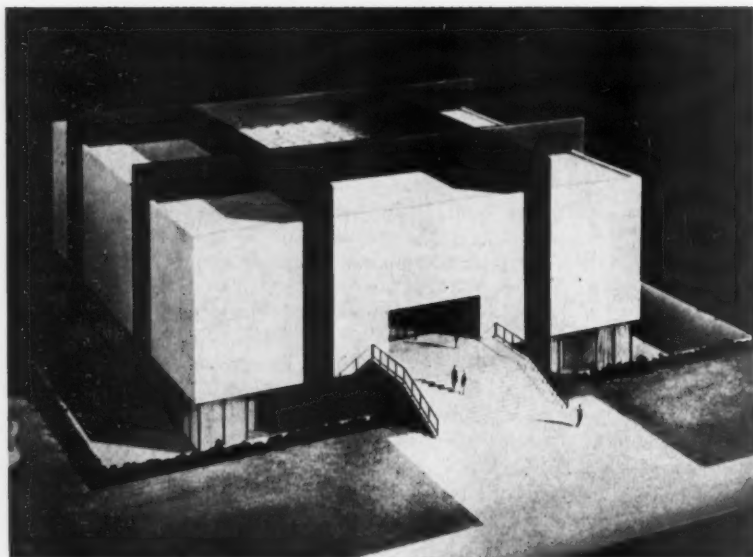
...beautiful new shapes for ACOUSTONE*

*T. M. Reg. U.S. Pat. Off.



ACCENT ACOUSTONE—Face edges of the 12" x 24" tiles are rabbeted to produce this dramatic accent.

A MUSEUM IN CONCRETE FOR UTICA



The first structural system utilizing an arrangement of monolithically intersecting, post-tensioned, concrete girders is found in the Munson-Williams-Proctor Institute Art Gallery in Utica, N.Y., which is nearing completion.

Designed by architect Philip Johnson, AIA, and engineered by Dr. Lev Zetlin, PE, both of New York City, the unique \$2.5 million structure represents a major engineering achievement.

Rising out of a 10-foot deep grass moat to a height of 52 feet 2 inches, the 117-foot square reinforced concrete structure is a lesson in provokingly simple beauty and "gutty" engineering.

Choice of structure

Four cast-in-place post-tensioned concrete girders, supported only at their ends by eight exterior columns, intersect at four points across the top of the building. Deceptively simple in design, their sharp, crisp pattern provides a structural system that eliminates the need for any interior columns above the main floor and makes possible a completely unobstructed auditorium and a main gallery with a 30-foot high ceiling.

The choice and design of what Dr. Zetlin calls a "two-way lattice girder system" was a bold, pioneering stroke. While its principles are known and well documented, the Munson-Williams-Proctor Institute Art Gallery represents its first significant application anywhere. Yet its use in this structure has been no mere experimental flirtation with the strength of materials. It was designed and used because it *could* be designed and used; and the advantages accruing from its employment represent an improvement over what has been done before.

Like the structure itself, its ultimates are pure and simple: the four *intersecting* girders provide a strength and stiffness equal to eight parallel girders of approximately the same size; or sixteen 2' x 2' interior columns.

Economically the two-way system represents a saving of roughly \$50,000; aesthetically it provides a vast expanse of free, uncluttered space throughout the main section of the building; and engineeringwise, it has meant less and more uniform deflection, and greater strength in the entire structural system.

For the man—Lev Zetlin—it is a personal triumph over the past of traditional engineering. It is, indeed, an ultimate expression of his philosophy that if a building is beautiful to the eye, it is structurally sound.

Method employed

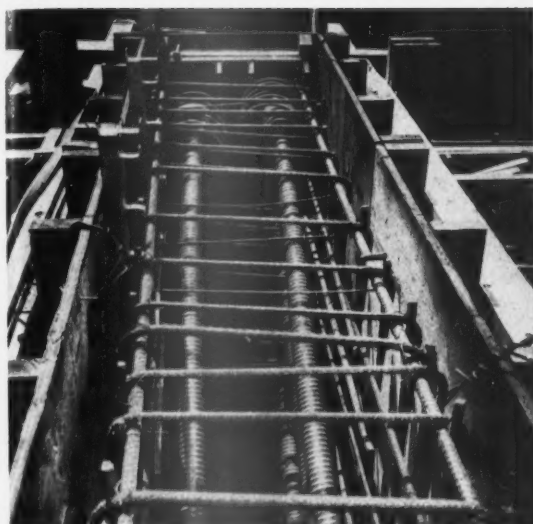
Each mammoth girder is cast in the shape of an inverted "T", measuring 123 feet 10 inches from end to end and 10 feet 9 inches high. The exposed portion of the girders are 22 inches wide with a 6-inch seat on each side, making them 34 inches wide at the invert. Weighing 180 tons and composed of 90 cubic yards of 5,000 psi stone concrete, each girder contains 14 post tensioning cables, each, in turn, composed of 25 individual ¼-inch steel wires.

The pattern formed by the criss-crossed girders leaves nine rectangular openings in plan, eight of which are closed by a total of 84 precast double "T" concrete slabs. The remaining 57-foot square center portion is composed of poured-in-place lightweight 3,750 psi concrete coffer section of 12 ribs and 11 spaces each way. The spaces will house plexiglass bubbles through which natural light will fill the main gallery.

The precast double "T's", weighing about one ton each and measuring 28 feet long, 4 feet wide and 14 inches deep, rest partly on the 6-inch seat of the pre-stressed girders and partly on the building's 11-inch thick concrete walls.

In addition to supporting the precast concrete roof, the girder system also partially supports a 30-foot wide

Photos: The Master Builders Co., Cleveland, Ohio.



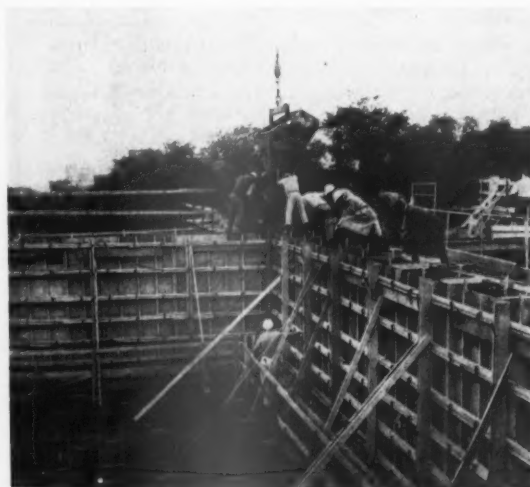
Close-up shows reinforcing detail. Steel spirals were placed around post-tensioning conduits at end of each when critical stress took place.

balcony that hangs 18 feet below the roof. Four 2½ inch thick steel rods threaded into each girder (a total of 16) provide overhead support for the balcony.

The superstructure walls of the building act as deep cantilevered girders (measuring 117 feet x 31 feet x 11 inches) supporting part of the roof, part of the balcony, and part of the main floor. A total of 648 cubic yards of lightweight concrete went into the forms for the four walls which were poured monolithically with the exterior columns.

Though they appear to float on the thin ribbon of glass that completely surrounds the ground floor of the building, the walls are actually supported 11 feet above the ground level where the columns themselves project into the building forming a kind of exposed foundation 22 inches thick by 11 feet high by 6 feet 6 inches deep.

Once concrete for the walls and eight exterior columns had been placed and stripped, forms were constructed for the intersecting girders. Actually, when they were through, workers had built one huge, elaborate form, looking for all the world like the beginning of a gigantic game of tic-tac-toe. (Continued on page 10)



Concreting at critical intersection of girders was done with great care. Zetlin and fieldmen from the admixture supplier were present during the 16-hour concrete placing period.

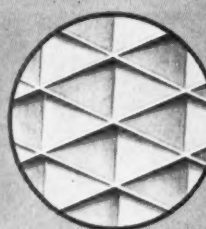
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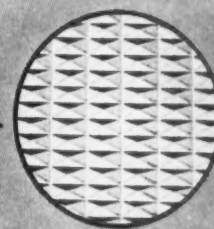
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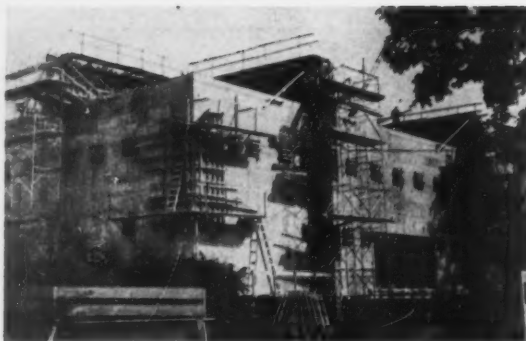
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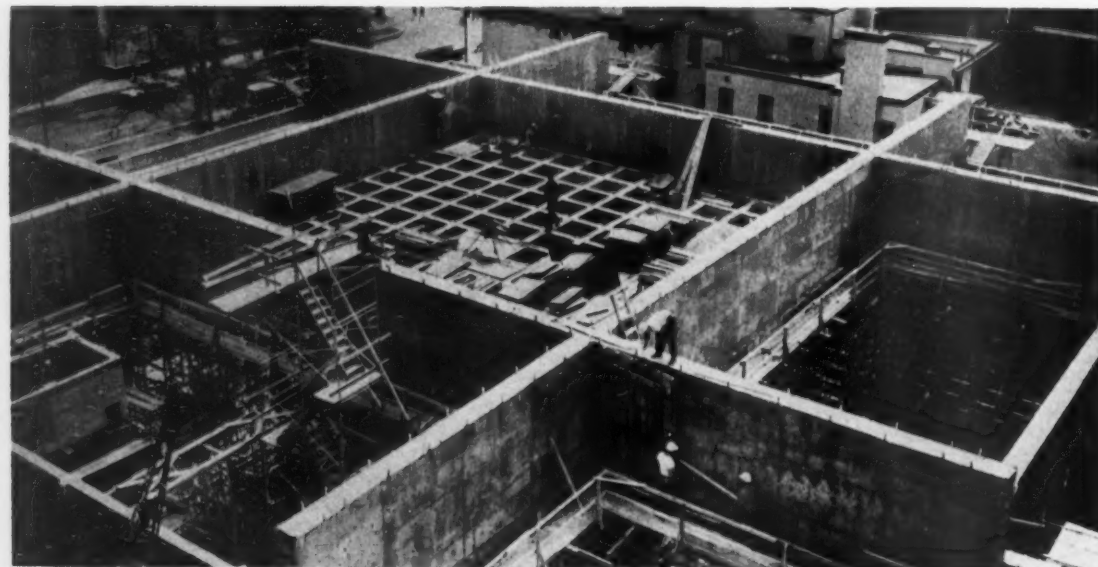




Form work on corner is for section of wall left unpoured for three months, later filled to compensate for shrinkage.



Jack grasped strands at upset buttons on end of each strand. Second upset was held by cone-shaped disc for anchorage.



Four intersecting girders, 123 feet 10 inches by 10 feet 9 inches, form a monolithic concrete structural system weighing 720 tons—supporting itself, the roof and the hung balcony, and eliminating the need for interior columns.

MUSEUM IN CONCRETE

(Continued from page 9)

Supported by shoring, the form was filled with a variety of hardware including ½-inch reinforcing steel bars, ¾-inch reinforcing stirrups, 4-inch diameter hollow sleeves for balcony rods, and—into each girder form—14 hollow, flexible, steel, post-tensioning conduits anchored at each end of the girder and draped in smooth parabolas. Each girder form was jacked up to form a 2-inch camber at its center and the concrete placing was ready to begin.

Five factors

Concrete for such a sustained and intricate pour required fastidious attention to its design and special care in its preparation and handling. Five principle factors influenced Dr. Zetlin's requirements and specifications for the mix design.

First, to meet the prescribed design loads of the structural system and to utilize pre-stressed concrete economically, the concrete had to have a compressive strength of 5,000 psi.

Second, the post tensioning pressure to be applied to the girders precluded the presence of horizontal cold joints or honeycombing.

Third, to insure a completely monolithic member, the set of the mix had to be retarded by three hours.

Fourth, because of the complex arrangement of reinforcing steel and delicate cable conduits in the forms, the mix had to have a high degree of workability.

And finally, Zetlin wanted as much early creep as he could get so that the girders would obtain all of their deflection at the earliest stages of construction.

Workable mixes

Specs for such a mix would require a sharp reduction in the amount of water and cement that would normally be prescribed, without reducing the needed workability.

To fill these stiff requirements, a testing laboratory working with fieldmen from the concrete admixture supplier, designed a 5,000 psi concrete containing 668 pounds of type I Portland cement; 1,280 pounds of sand; 550 pounds of #1 stone; 1,280 pounds of #2 stone; and 32 gallons of water, weighing 144 pounds per cubic foot. To this mix was added ¼-pound of a water reducing, set controlling admixture, which, by

reducing the required water by 20 per cent, imparted a highly workable 3½ inch slump to the mix without disturbing the critical water/cement ratio.

A companion 2½ inch slump mix was designed and placed during the later stages of the pour to insure equal rate of hardening. Through the action of the admixture, the set of the mix was retarded by as much as 3 hours.

All concrete was closely controlled and was predetermined by trial mixes approved personally by Dr. Zetlin. Four test cylinders were cast for every 80 yards of concrete with seven day breaks averaging 4,200 psi; 14 day breaks averaging 4,985 psi; and 28 day breaks averaging 5,665 psi with a high of 6,230 psi. Modulus of elasticity tests were also performed on the concrete to determine expected deflections of the members.

Placement of concrete

Concrete placement for the girders began at 8 a.m. with two crews and two cranes starting in adjacent corners and working right across the top of the building. At 5 p.m. an additional crane and crew joined in. The operation was completed shortly after midnight. Concrete was hoisted to the top of the building by crane, in one yard bucket loads, and eased into the forms through elephant trunks.

Nine 6-cubic yard transit mixers were kept busy during the 16-hour placing period, bringing in a total of about 22 cubic yards of concrete per hour.

What ultimately went into the great, criss-cross form was a highly workable mix that produced 28 day strengths in excess of 5,000 psi. In reducing the water content by 20 per cent, the pozzolan admixture induced early development of creep, a girder system free of cracks through minimum drying shrinkage; and a completely monolithic member through controlled rate of hardening.

Zetlin attacked the problem of shrinkage, not only in the girders through the use of the admixtures, but in the building's decks. A 3 x 20 foot area in the corner of each floor was left unpoured for a two-month period, during which time almost all shrinkage occurred. The open sections were then concreted leaving a perfectly crack-free system of floors.

The same technique was employed in the placement of the superstructure walls with a three-foot wide corner section left open the full height of the walls in all four corners and filled 60 days later.

Other openings in the concrete superstructure walls—later filled—were also left to permit easy placement of the concrete for the balcony.

The exceptional strength of the intersecting concrete girder suspension system is derived from its unique design and from the great stress placed in the girders through post tensioning, employing the P.I. system of anchorage.

Flexible steel conduits

Prior to the huge continuous concrete pour, workers installed two rows of seven hollow, flexible steel conduits in each girder form. The 14 ducts, measuring 2 inches by 122 feet 3 inches, were draped in smooth parabolas and were anchored to steel end plates at both ends, with 28 ducts crossing neatly at the four girder intersections.

Workers eased and carefully vibrated the concrete into the forms to ensure a positively homogeneous mass; and to make certain that the conduits were completely surrounded by concrete, and not damaged in any way.

Stressing methods

Side forms were stripped within 48 hours and by two weeks the concrete had gained sufficient strength for post tensioning.

Twenty-five parallel ¼-inch steel, post tensioning

wires were threaded through each conduit, an operation saved for after concrete placing, to be sure no kinks, bends or breaks had occurred in the conduit which might hamper the movement of strands during stressing stages. The 25 wires, banded together, were placed in the ducts simultaneously. A liquid detergent soap, which would have no chemical effect on the grout to be used later, was used to ease the tendons through the conduit.

The anchorage system utilized an interior head, a split head and a bearing plate. Wires were gripped around upsets, one at each end and one a short distance from the end of each strand.

Stressing took approximately 2½ weeks. Starting at the bottom of a girder, workers applied half the stress to each tendon end, working around the perimeter of the girders, pulling the bottom layers first and working upward. The topmost tendons were stressed last.

For design purposes, each tendon was required to maintain a final load of 175 kips. But in order to compensate for the creep in the steel, a total force of 206 kips was placed in each tendon. Initially, in order to overcome friction during the tensioning, a force of 218 kips was provided. Then each tendon was released to 206 kips and anchored. As time passes, the force of the tendons will creep, at an ever decreasing rate, indefinitely, toward—but never quite reaching—the required 175 kips. In tensioning each girder to a total of 2,884 kips, each tendon was pulled approximately 8½ inches.

The stressing of the girders added an additional ½ inch to the already 2-inch camber of the girders for a total camber of 2½ inches; and shortened each girder by ¼ of an inch at each end.

Supervision procedure

Looking ahead, Zetlin foresaw that even this minute movement of the girders as they shortened might crack the walls and vertical columns, and employed a device to prevent such a mishap. At the point where the girders rest on the columns, two 18-inch milled, highly polished and lubricated steel plates were embedded in the concrete with one face exposed; one, curved, on top of the column and one, flat, on the bottom of the girder. Careful measurements before and after stressing revealed zero motion in the columns. After stressing was completed, the plates were welded together and sealed from exposure.

The ½-inch upward movement of the girders on the plates was enough to lift them off the shoring, and their new-found strength turned them into a complete structural system capable of supporting itself, the precast roof and the hung balcony.

When the balcony is hung and the precast concrete sections are placed in position, the system will deflect downward 1½ inches, and during the coming year the 720 ton concrete tic-tac-toe will gradually descend its final one inch and assume the horizontal. Dead load of the roof is 75 lb. psf and 150 lb. psf for the hung balcony. Live load designs for the system are: 40 lb. psf for the roof and 100 lb. psf for the balcony, taking into consideration people and art objects.

With tensioning completed the conduits were completely grouted with a sand cement grout.

In accepting the commission to design the new museum, Philip Johnson named flexibility and intimacy as two of his main goals for the structure. "It has to inspire a feeling of a cathedral," he said, "yet be as intimate as a cottage." He noted that a person must never be more than one room away from the central main gallery. The visitor must not have a feeling of being lost in a labyrinth.

"The problem," he said, "is to have space to hang paintings and at the same time make the museum a

(Continued on page 12)

How much fire protection should a floor-ceiling assembly provide?

Many specifiers doubt that there ever is a real question of how fire resistant a floor-ceiling assembly should be. They know that to provide less protection than that required by local codes is illegal. And they believe that extra protection not only "over protects" a building, but also automatically costs more.

local building codes should be minimum standards

However, recent experience has shown that local code requirements should be *minimum* standards and that additional fire protection need *not* cost more. Consider the example of Armstrong Acoustical Fire Guard, the only acoustical ceiling tile to offer rated fire protection to the structural components of a building.

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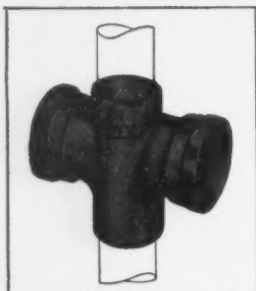
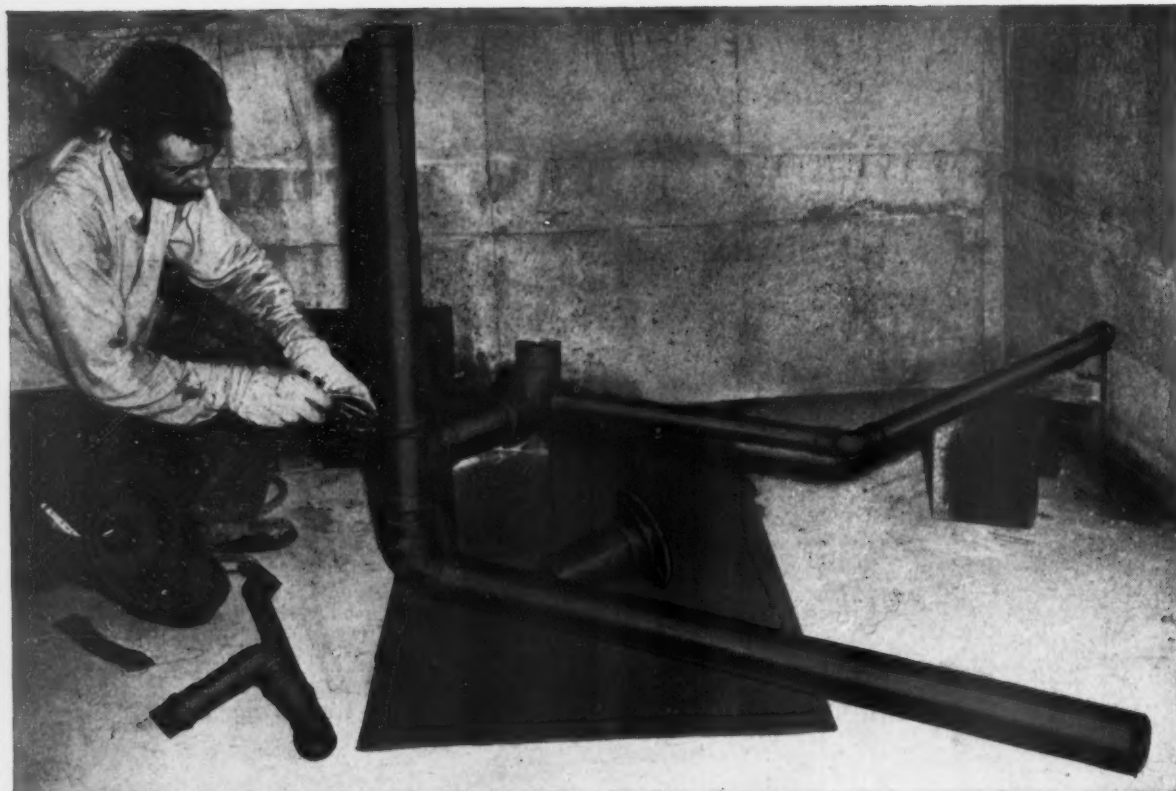
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MUSEUM IN CONCRETE

(Continued from page 11)

pleasant place for people to congregate. A museum should not just be a depository of art but also a community center. The modern museum should be a center of the cultural life of a town and the buildings designed to house it should encourage this use for all the arts including music."

Finish materials

The building facade has approximately 1,500 blocks of Black Canadian Granite, from the northern Hudson Bay area, covering the exterior concrete walls.

The columns and girders are sheathed in bronze, to provide a striking contrast against the textured, 4-point cut of the dark gray stone. Floors of the balcony and main exhibition room are covered with Italian Travertine marble, with all other floors terrazzo topped. The ground floor windows, which provide the ground floor rooms and offices with one complete glass well, are framed in dark gray painted aluminum.

Heavy teak plywood is used on the walls in the lobby and main hall with vinyl on all the office wall surfaces. Pandanus cloth, applied to all the gallery walls, will conceal holes made in the hanging of the changing exhibitions.

Plan features

Included in the design are a 300-seat auditorium on the ground floor; two exhibition floors for painting and sculpture; office space; and fireproof storage. A roadway to the ground floor will permit delivery to storage and access to the office area. Plans also call for large off-street parking facilities and landscaped grounds.

Passenger elevators serving all floors are included, as well as a capacious freight elevator capable of handling the largest of the museum's paintings or statuary. The building has no actual street level. The ground level rests in the 10-foot deep moat; while access to the main floor is gained by 13 steps leading up 6 feet from the street.

Excavating for the museum meant blasting a hole 45 feet deep and 200 feet in diameter, removing 18,000 cubic yards of shale. Individual spread footings measuring 7 feet by 11 feet by 3½ feet were placed for each exterior column.

The sub-basement and basement are 6-inch thick concrete slabs, while the main gallery floor is an 8-inch flat plate concrete slab. The hung balcony will have a 10-inch thick concrete floor. All concrete above the ground level is lightweight.

The structure was built by The George A. Fuller Co., New York City, with Jack Madden, project supervisor, and William Gardner, engineer. Supervising architects were Bice and Baird, Utica.

The new museum is the most recent achievement of the Munson-Williams-Proctor Institute, a corporation chartered in 1919, by the regents of the University of the State of New York. Thomas R. Proctor and Frederick T. Proctor and their wives, the former Rachael and Maria Williams, granddaughters of Alfred Munson, Utica financier, were the prime movers in establishing the institute.

Today, the institute functions under the direction of a board of Trustees with James W. Dimon as Chairman.

The range of the institute's collection of 400 major paintings represents many established and eminent artists. The exhibition of the art, sculpture and print collections consisting of more than 1,800 pieces, selected visiting art shows, and six Great Artists Series Concerts, currently swell the institute's total annual attendance to well over 40,000.

The model of the projected restaurant at Dimond Canyon, Calif., by architects Luckman and Cadawalader—dramatizes the versatility of concrete as a medium of architectural expression. Continuous research, each year, contributes to our knowledge of the dynamic potentialities inherent in this most plastic of building materials. A/E News recapitulates some of the findings and applications of this past year.

Those slow moving Romans

Some light was shed at the recent convention of the American Society of Civil Engineers on why it would appear that the concrete produced by the ancient Romans in making their aqueducts was more lasting than concrete used in construction today.

The reason is simple, according to M. E. Prior, of Cambridge, Mass., who presented a paper on achieving better concrete through chemistry at the meeting.

"The Romans were not in a hurry," Mr. Prior, of the Dewey and Almy Chemical Division, W. R. Grace and Co., explained.

"The concrete they made was not put into service for a long time, possibly several years, after it was placed. It had plenty of time to adequately cure and develop strength.

"The cementitious material was a slow hydrating type and gained strength very slowly compared to our standards."

He said that it was possible to produce the type of concrete used by the Romans but because of present day concepts no one would accept it.

"We demand that the concrete be ready to take the full designed load almost as soon as it is placed," he pointed out. "In order to meet these requirements, the cement chemists have adjusted chemical compositions and fineness, admixture chemists have provided hydration aids and water reducing materials, but despite all of this we still haven't been able to duplicate the effect of time.

"We are making progress, but the old adage to the effect that the longer it takes to produce a material the longer it will last, still holds true to a certain extent."

The cement and concrete chemists are never idle, Mr. Prior declared. New ideas are being investigated daily, he added, and the future of the application of chemical admixtures in Portland cement is unlimited.

"The next few years will bring completely new chemical admixtures to make Portland cement even more versatile and efficient than it is at the present time," he predicted.

Economy of prestress concrete in spans

The use of prestress concrete in bridge construction in Texas was reported as "both practical and economical" in a paper presented by Wayne Henneberger, supervising designing engineer of the Texas Highway Department, before the ASCE convention. He told of the use of material in structures spanning railroad tracks at San Antonio.

Mr. Henneberger stated that in the original planning it was decided a design using continuous I-beam spans could meet the requirements.

"However, by the time the structural designing was begun," he said, "the availability of structural steel for immediate construction was doubtful since other projects under contract were being delayed 12 to 16 months awaiting steel deliveries.

The decision was made to design the structures utilizing prestressed concrete, even though we realized the longer spans would present some difficult problems."

But, he said, the construction of the project moved along rapidly without delay and was opened to traffic in 1959. The majority of spans on the structures are

CONCRETE|THE YEAR PAST



Plan of projected restaurant at Dimond Canyon, Calif. Luckman and Cadawalader, Oakland, Calif., are the architects. (See "Preview 17," page 52, for project coverage.)

less than 68 feet.

He noted, however, that the limited experience on the San Antonio project with prestress concrete indicates its use in spans above approximately 90 feet "is practical and economical."

"Determination of physical properties of the concrete to be used, and proper control of stress loss are factors which must be considered before designs are final.

"We believe the use of prestress lightweight concrete will gain importance, particularly in those areas where hard rock aggregates are getting scarce. Certainly it is a field which deserves consideration from the bridge designer."

Freezing and thawing tests and prestress

Results on a study of the effects of freezing and thawing on prestressed concrete, a matter of vital concern to the construction industry, were also reported to the ASCE convention.

In a joint paper, a Purdue University professor and a design engineer reported that, based on the results obtained and within the limitation of the variables studied in the experiments they undertook, the following conclusions were drawn:

1. The post tensioning of concrete improves its effective durability against freezing and thawing.
2. Continuously post-tensioned concrete, having a minimum ultimate strength of 5,000 psi after 28 days is effectively more durable than unstressed concrete having minimum ultimate strength of 3,000 psi after 28 days.
3. Continuously prestressed concrete is effectively more durable than intermittently stress-released concrete of the same mix. Furthermore, in four out of the six cases observed, the latter is apparently more durable than unstressed concrete of the same mix.

The authors of the paper were M. J. Gutzwiller, associate professor of structural engineering at Purdue University, Lafayette, Ind., and F. E. Musleh, design engineer of the firm of Pierce, Gruber and Beam, Inc., and formerly a graduate assistant in structural engineering. The research was conducted in the Joint Highway Research Laboratory at Purdue, and was sponsored by the Joint Highway Research Project.

"Prestressed concrete offers many advantages and has many new important applications in civil and structural engineering," the authors noted.

"The fine cracks that develop in conventional reinforced concrete cannot be avoided, but with the use of prestressed concrete, the absence of cracks as a permanent feature can be assured up to maximum design loading.

"Prestressed concrete members having large span-to-depth ratios can be used. This means a saving in the volume of concrete to be used in a given structure. The prestressing of steel used is a high-strength grade of steel, resulting in a smaller weight of steel."

The authors noted that the difference in the cost ratio of materials to labor in the United States, as compared to some European countries, has influenced the direction of the development of the new use of materials.

Consolidation of concrete

How vibrators can be used to best advantage in concrete work was spelled out in a report presented at the recently held 56th annual convention of the American Concrete Institute in New York City.

Compiled by ACI Committee 609, the report, "Consolidation of Concrete," was presented by Committee Chairman Joseph J. Waddell, of Knoerle, Graef, Bender and Associates, Inc., Chicago.

(Continued on page 14)



Inside steel forms are prestress cables and piping utilized for bridge beam drainage. Alongside is high tensile strength cable.



The hinged steel form section may be drawn from the prestressed concrete beam and positioned at an angle when hinge pins are removed and flexible legs positioned.



Men and concrete—final concrete placement in forms is made within a short time of first pours for concrete consistency within the beam. Vibration eliminates air voids. (Above photos: courtesy Blaw-Knox Co.).

CONCRETE/THE YEAR PAST

(Continued from page 18)

The report briefly reviewed the development of concrete consolidation methods, from hand tamping to mechanical vibrating. Advantages of vibration, types of equipment, and design and construction of forms used with vibrating equipment, were described. Also discussed was the effect on consolidation of proportioning, slump, sand content, maximum aggregate size, and grading of the aggregates in a mix.

Advantages of vibration

The advantages of consolidating concrete by vibration include: lowered cost of concrete through ease of placement and by reduced cement content; greater concrete density and homogeneity; greater strength; improved bond with reinforcement; greater bond at construction joints; greater durability; and reduced volume change or shrinkage. The savings achieved and improved qualities in concrete are now so well established that vibration has become an accepted practice in practically all types of concrete work, the report noted. That so many improvements can be attributed to one innovation makes vibration one of the greatest advances in concrete technology.

Consolidating equipment may be divided into five general categories, each type designed to accomplish a specific purpose: (1) immersion vibrators, inserted directly into the concrete; (2) form vibrators, attached to the forms or molds; (3) vibrating screeds or pans, applied to the surface of concrete; (4) surface tampers; and (5) miscellaneous tampers and shakers.

For most structural concrete, vibration is most efficiently performed by standard immersion vibrators.

Determining complete consolidation

Adequacy of vibration is judged mainly by surface appearance. Embedment of large aggregate, general leveling of the batch, apparent blending of the batch perimeter with concrete previously placed, and general cessation in escape of large bubbles of entrapped air are evidence of adequate vibration. Particularly important is vibrating at proper depths and spacing.

A 3-inch maximum slump is ample for properly vibrated structural concrete in forms but what may be regarded as a need for wetter concrete in many quarters is better satisfied by more thorough vibration. Not only is superior workmanship in placing better assured with more vibration, the report pointed out, but the quality of concrete can be improved because the water content can be lowered with less slump. The opportunity to obtain concrete of superior quality, and possibilities for mix economy, can be lost if modern vibration equipment is not fully utilized to place concrete of these lower slumps.

The report also explained that allowing the vibrator to penetrate completely through the layer being placed and into the underlying layer helps to weld the two layers thoroughly together. The revibration of the previously placed concrete is beneficial because it rearranges the aggregate particles and eliminates entrapped water from under the aggregate and reinforcing steel, with consequent full contact between the mortar and coarse aggregate or between the steel and mortar. The resulting concrete is stronger and more watertight.

Additional vibration is beneficial

Air bubble holes can be substantially eliminated from vertical formed surfaces by additional vibration, which may be as much as twice that normally required for consolidation and prevention of honeycomb. Vibration should be increased by closer, deeper and longer penetrations. Form vibration also aids materially in re-

ducing air bubble holes.

Thin slabs such as sidewalks and floors are best consolidated by means of a surface vibrator, the report continued.

Care must be taken that vibrators are used to consolidate concrete that has been properly placed, and that they are not used to move concrete about in the forms.

There are few imperfections in concrete placing workmanship, the report concluded, that cannot be corrected by additional vibration. The proper use of vibration will allow the placement and consolidation of concrete in difficult locations and at a comparatively low slump. High slump concrete will not insure good results; in fact, it will foster separation and unsatisfactory results. The modern concrete vibrator is a remarkable tool with great potential for making practical a use of lower slump concretes. These lower slump concretes provide better quality and greater economy than have been obtained generally in the past, and full use of vibrators can be made to gain these benefits without fear of over-vibration.

Restoring deteriorated concrete

At a symposium sponsored by ACI Committee 201, Durability of Concrete in Service, chaired by Hubert Woods, research director for the Portland Cement Assn., Chicago, Lewis H. Tuthill, concrete engineer for the California Department of Water Resources, Sacramento (and currently an ACI vice-president), outlined conventional techniques of repairing concrete. He emphasized that a good concrete repair or restoration must be thoroughly bonded to the older concrete; must be sufficiently impermeable to prevent moisture reaching underlying older concrete; must, after drying, be free of shrinkage cracks through which water could reach the supporting concrete; must be resistant to freezing where this is a factor in weathering; and should match surrounding concrete surfaces.

On new or restoration work, all unsound concrete should be removed completely. He recommended shaping the excavations so as to make the replaced material as secure as possible, and that surfaces be cleaned and moistened for maximum bond. For cleaning, sand blasting should be preferred to scrubbing with a wire brush.

Although moistening of older concrete is usually advised before bonding, Mr. Tuthill observed that on joint surfaces possibly more permanent bond can be secured when these surfaces are dry at the time they are overlaid with fresh concrete. The effort formerly expended on moistening before the repair is transferred to more water curing afterward.

He also advised that for the restoration of weathered spillways, piers and other hydraulic structures, reinforced air-entrained concrete is probably preferable to shotcrete. Other factors effecting bond, permeability, cracking, durability, and appearance of concrete repairs were also detailed.

Patching of pavements

The patching of distressed areas of concrete pavements with bonded concrete was discussed by Earl J. Felt. Mr. Felt is manager of the Transportation Development Section, Research and Development Division, Portland Cement Assn., Skokie, Ill.

Mr. Felt cited several instances where a long-lasting bond of relatively thin layers of concrete (1 to 3 inches) to old base concrete was secured. Some of these streets are still in service 40 years after resurfacing.

Field investigations and laboratory studies conducted by the Portland Cement Assn., have uncovered basic requirements for good bond between new and old concrete, Mr. Felt explained. Most important is clean, sound, old concrete surface. One group of PCA tests

has shown that cleaning and slight roughening of an old sound surface with hydrochloric acid developed acceptable bond in the range of 300 to 500 psi. Chipping the old surface with an electric chisel improved bond, but the most effective tool for mechanical cleaning and for removing unsound concrete was the Tennant machine. Sand blasting was not particularly effective in these tests.

Probably the most common defect in concrete pavements is spalling at the joints, frequently caused by poor jointing design or improper construction. If air-entrained concrete has been used, the spalls are hard, durable concrete and the shearing surface makes a good base for a bonded concrete patch. Many pavements made of non-air-entrained concrete still exist, however, and spalling at joints is also associated with concrete disintegration. Here, the concrete may not be in good condition and considerable preparation will be required before patching with bonded concrete.

In addition to good surface condition of the old concrete, high-quality grout and concrete, first class workmanship in placement and compaction, and proper jointing and curing are essential.

Prepakt method of concrete repair

The prepakt method which is now widely used for repairing concrete was described by Raymond E. Davis, a consulting engineer in Berkeley, Calif., and director emeritus of the University of California's Engineering Materials Laboratory.

Prepakt was first used in 1938 in the strengthening and stabilizing of the concrete lining of Muir tunnel on the Santa Fe Railroad near Pittsburgh, Calif. Since then, the prepakt method has found many applications in the restoration of old concrete and masonry structures. It has also gained favor for certain types of new construction where the proper placement of conventional concrete is difficult or impossible, such as underwater work.

Prepakt is essentially a concrete of gap grading which is produced by first placing the coarse aggregate in the forms, and then pumping a sanded grout, sometimes referred to as intrusion mortar or prepakt grout, into the voids of the aggregate mass. In the repairs of many old stone masonry and concrete structures by the prepakt method, neat cement grouting for the purpose of improving structural stability and reducing leakage is also carried out.

Mr. Davis pointed out that bond strength between new prepakt concrete and old conventional concrete is much higher than that obtained between new and old conventional concrete. This is probably due to the grout being applied under pressure. Prepakt's wetting properties and its fluidity is much greater than that of the usual mortar constituent of ordinary concrete.

Another property in which prepakt excels is low drying shrinkage, which is likely to be only about one-sixth as great as the usual mortar applied pneumatically and less than half as great as that of conventional concrete. This low drying shrinkage, thought to be due to point-to-point contact of the pieces of coarse aggregate, also promotes greater crack-resistance, Mr. Davis explained.

Also, based on laboratory tests and performance of field structures over a period of years, prepakt concretes of suitable materials and good workmanship resist weathering action caused by freezing and thawing better than conventional concretes. Later-age strength of prepakt concrete is also considerably greater.

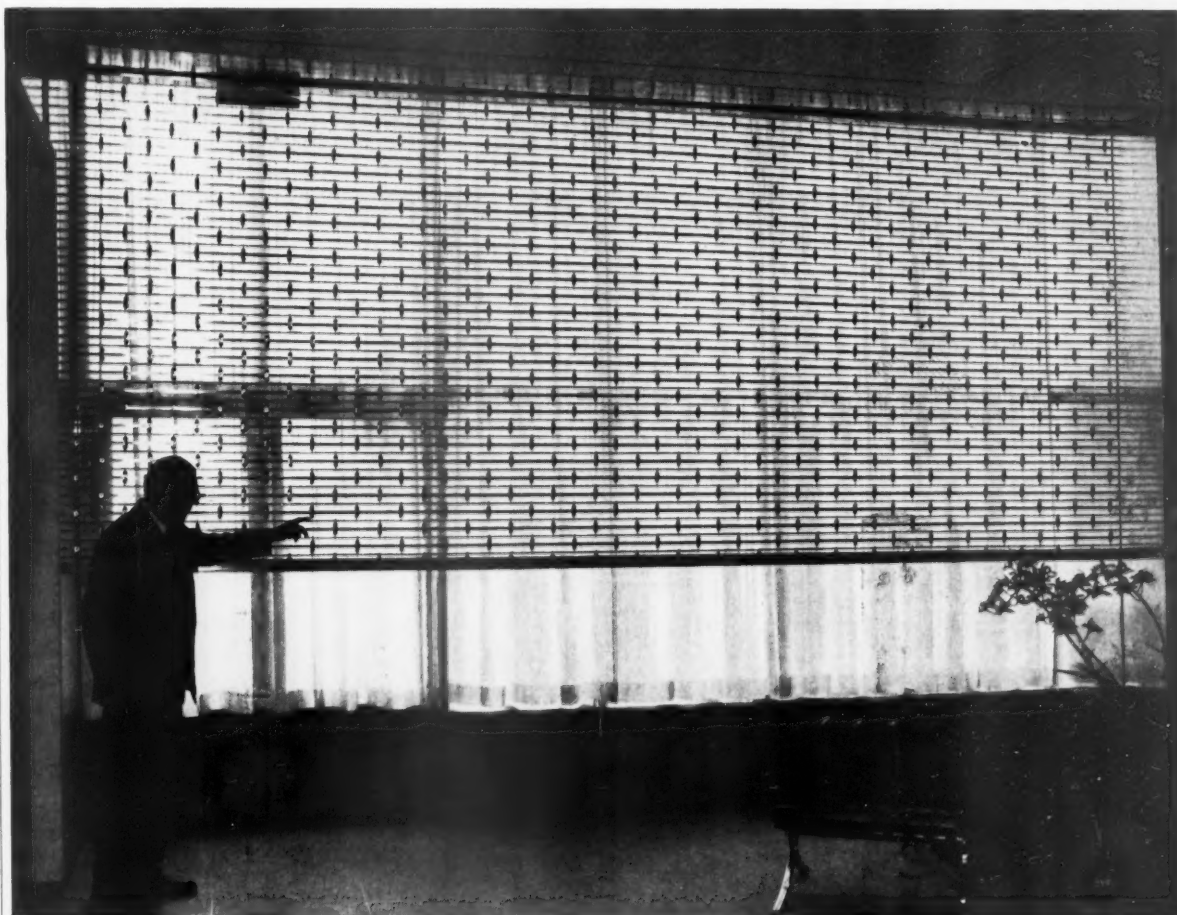
Repairing with epoxy resins

How the California Division of Highways uses adhesives and binders containing epoxy resins to repair

(Continued on page 16)



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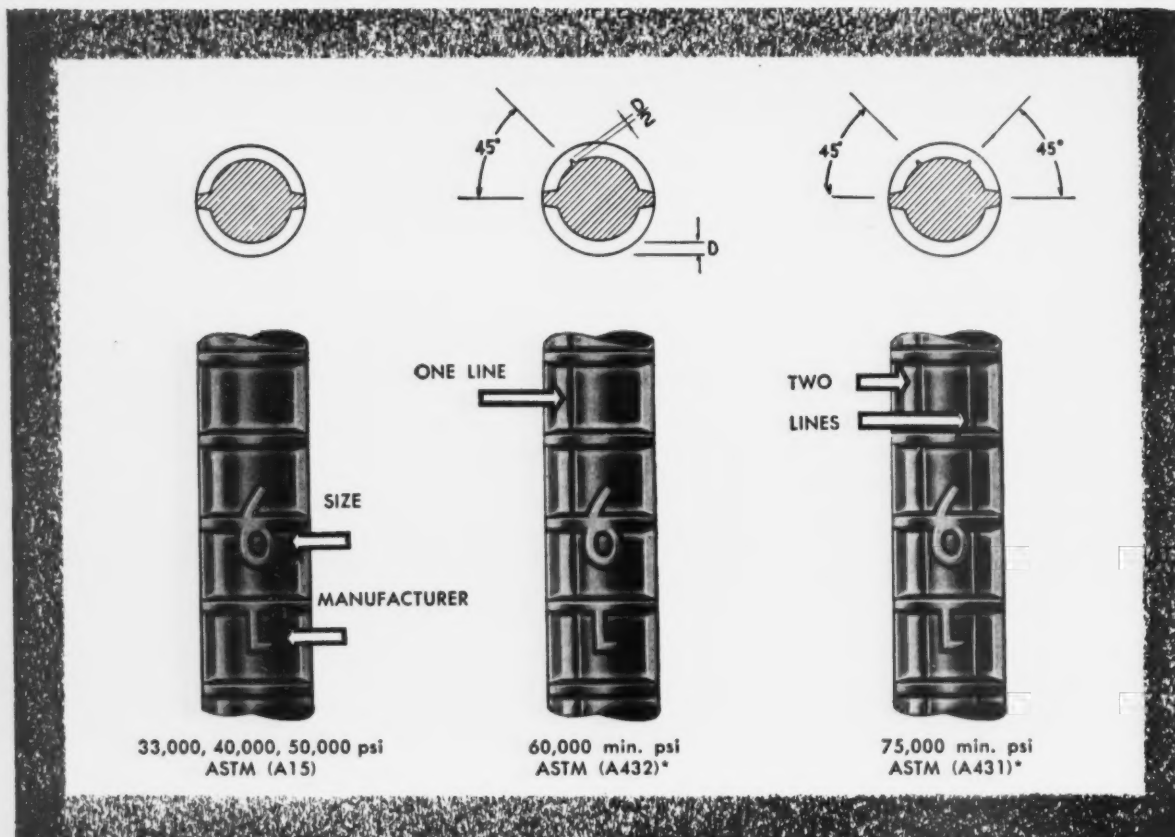
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16

CONCRETE/THE YEAR PAST

(Continued from page 15)

concrete was outlined by Bailey Tremper, supervising materials and research engineer for the Division, Sacramento.

Only epoxy resins of low viscosity find application as concrete repair materials. The bond strength of properly formulated adhesives is greater than that of concrete, as has been demonstrated in many tests. Rupture always occurs in the concrete, not in the adhesive bond, Mr. Tremper reported.

Adhesives and binders for highway use are formulated of epoxy resin, a plasticizer and a curing agent. Depending on the viscosity at the time of mixing, a certain amount of finely ground inert filler such as talc or silica can also be added.

For the repair of highways and bridges under traffic, quick hardening is desirable but this complicates the mixing and handling of the compound since rapid hardening formulations also have a short pot life. In general, small batches must be mixed and applied promptly. The choice of curing agent (generally organic amines) and the percentage used determine the pot life and the setting time.

In patching spalled areas with epoxy mortar or concrete, the binder used by the California Division of Highways contains no filler and has a pot life of about 20 minutes at 70°F. Under favorable conditions, the repair has been opened to traffic within three to five hours. In cool weather, metal chambers are placed over the repaired area and they are warmed with torches.

Epoxy concrete is considered economical to use in fairly large volume on heavily traveled structures such as the San Francisco-Oakland Bay Bridge. But if substantial repairs are involved and if traffic conditions permit, it is more economical to use Portland cement concrete bound to the original work with a coating of epoxy adhesive.

As in other concrete repair work, the surface to which an epoxy adhesive is applied must be scrupulously cleaned, preferably by sandblasting. Concrete may be damp but must be free from surface moisture when the adhesive is applied.

Restoring with pneumatically placed mortar

O. N. Kulberg of Los Angeles discussed the experiences of the Southern California Edison Co., during the past 40 years in restoring concrete structures with pneumatically placed mortar (shotcrete). Mr. Kulberg is chief construction engineer for the utility firm.

In addition to use for ordinary concrete repair, several million square feet of pneumatically placed mortar are employed in the company's complex of canals, flow lines and dams. In no instance, Mr. Kulberg explained, has this mortar undergone direct deterioration from weathering such as the scaling and spalling shown by low air-entrained conventional concrete under severe exposure.

However, there are areas of severe weathering in the Sierra Nevada mountains where difficulty has been encountered in pneumatically placed mortar restoration work on several dams. Failure of the parent material upon which the mortar has been placed, or lack of understanding on how to maintain it were the chief points of difficulty. Generally, though, all pneumatically placed mortar, regardless of how maintained, has had sufficient longevity to justify its use, Mr. Kulberg said.

Edison Co. experience points up the fact, Mr. Kulberg said, that reinforced and dowelled pneumatically placed mortar, when properly maintained, is the most economical method of restoring disintegrating concrete where restoration is shallow and over large areas.

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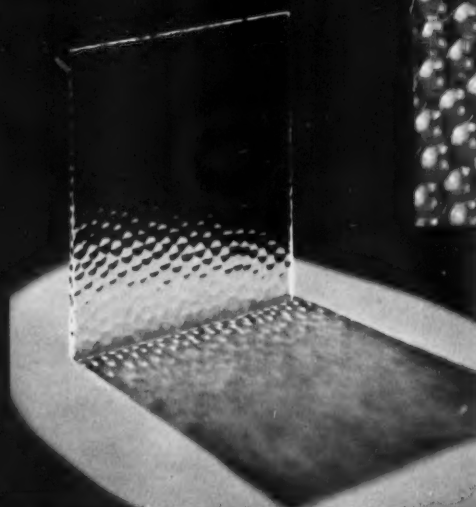


Square D Company Plant on Goodhope Road, Glendale, Wisconsin. 240 lights of 30" x 60" Coolite Heat Absorbing Glass are glazed around the top rim of the building. Architect: Grassold-Johnson & Assoc., Milwaukee, Wisconsin. Glazing: Pittsburgh Plate Glass Company, Milwaukee, Wisconsin.

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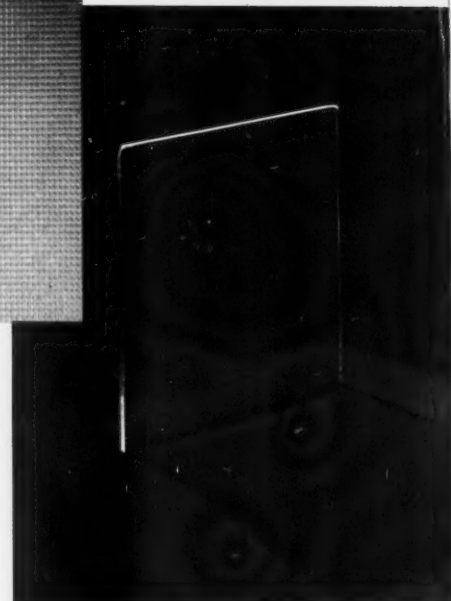
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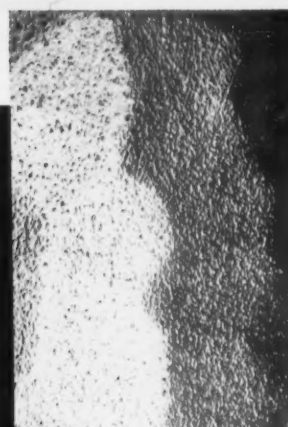
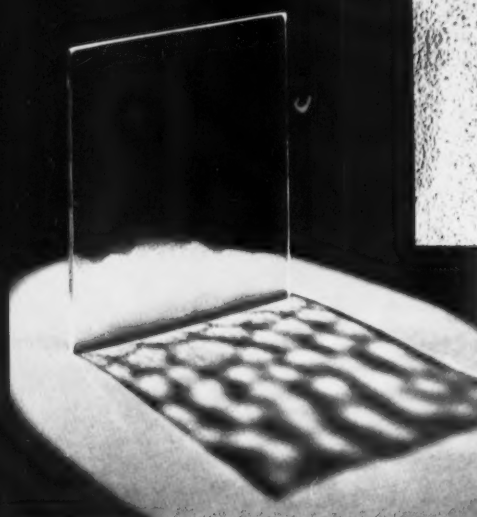
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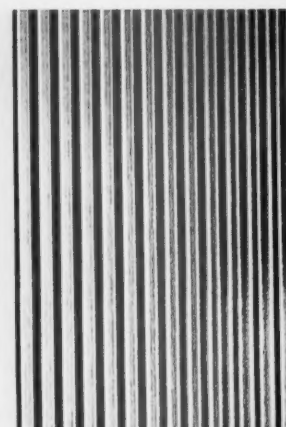
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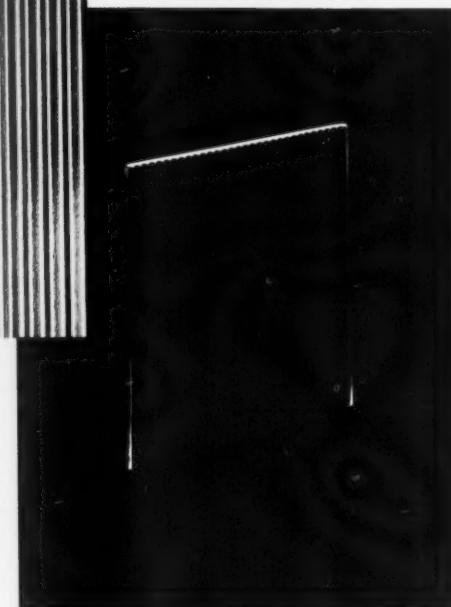
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This paper describes a test developed by the authors during the past year. A non-destructive test was needed for winter concreting studies so that strength measurements might be taken repeatedly on specimens subjected to cycles of freezing and thawing.

The test procedure described is a modification of ASTM Method C 403-57 T (Tentative Method of Test for Rate of Hardening of Mortars Sieved from Concrete Mixtures by Proctor Penetration Resistance Needles, 1958 Book of ASTM Standards, Part 4, p. 712), which measures the rate of hardening of mortar sieved out of ordinary structural grade concrete. The test, which is conducted by penetrating the mortar with a Proctor resistance needle, has been modified to measure compressive strength for low-density concrete (less than 40 lb per cu ft, oven-dry density).

The investigation included a comparison of the penetration readings for different needle sizes and the development of curves for eliminating the needle-size effect. The depth of penetration was also studied to determine the optimum depth for the strength test. The human element in running the test was evaluated by employing five different operators. The variability of the readings was compared to that of the cube compression tests on the same material.

Results of the Proctor penetration resistance test were calibrated against the cube compression tests to develop a conversion factor.

Test equipment

The Proctor penetration resistance apparatus used in this test consists of a plunger fitted to receive interchangeable needles at the lower end. Its length is 29 in., its weight 4 lb. Needles range in size from 1/40 sq in. to 1 sq in. bearing area. The apparatus has a spring stock with 1-lb graduations accurate to 1 lb and graduated from 10 to 130 lb. The needles used in this work were scribed with a line around their circumference 1/4 in. from the bearing face.

A pocket version is also available. The small Proctor apparatus has a fixed needle of 1/20 sq in. The small instruments are accurate in the range of 3 to 16 lb. They are, however, calibrated with a scale used for soil bearing measurements, which must be multiplied by a

constant to obtain the correct readings in pounds.

Test procedure

The procedure was carried out in accordance with following instructions:

Insert a needle of appropriate size, depending upon the state of hardening of the concrete, in the Proctor penetration resistance apparatus. The needles should be scribed 1/4 in. from the bearing face in order to gage the depth of penetration. Gradually and uniformly apply a vertical force downward on the apparatus until the needle penetrates the concrete to a depth of $1/4 \pm 1/16$ in. The time required to penetrate shall be approximately 5 sec. Record the force required. Make a minimum of five penetrations. The penetration resistance in pounds per square inch is calculated by dividing the Proctor reading by the cross-sectional area of the needle. The 1/20-sq in. needle is recommended for ordinary strength measurements. The larger needles are useful only when measuring the strength gain of "green" concrete.

Test variables

Size of Proctor needle—Since there is considerable overlapping of the ranges covered by the various needle sizes, it was possible to compare results from different needle sizes. Figure 1 shows the relationship, on the same concrete specimen, between the penetration resistance of a 1/20-sq in. and a 1/10-sq in. needle. The penetration resistance obtained with the 1/20 sq in. needle is 22 per cent higher than that obtained with the 1/10 sq in. needle.

Comparable graphs for the other needle sizes were drawn to develop the family of curves shown in Figure 2. These curves, the results of 160 comparative tests, adjust the penetration resistance obtained from any needle size to that of an arbitrary standard needle size, in this case the 1/20 sq in. needle. As indicated in Figure 1, these curves are valid for vermiculite, perlite, and foam types of low-density concrete.

Depth of penetration—As might be expected, penetration force increases with depth of penetration. The relationship is not linear, however, and as the penetration depth is increased, the increase in the required force diminishes. Fig-

(Continued on page 20)

Presented by I. A. Benjamin and G. D. Ratliff at the 62nd annual meeting of the American Society for Testing Materials. Reprinted from ASTM Bulletin, October, 1959, N. 241. I. A. Benjamin is Director of Research and G. D. Ratliff a member of the Research Department of Granco Steel Products Co., St. Louis, Mo.

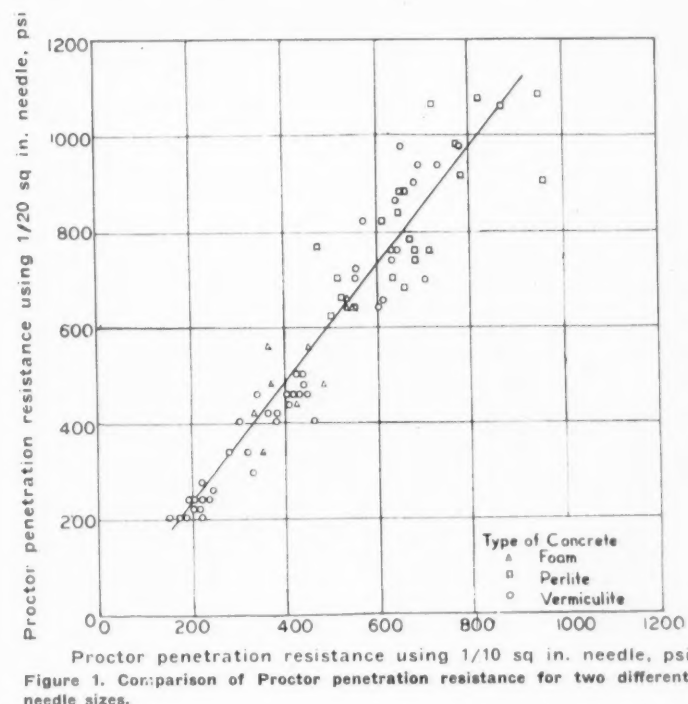


Figure 1. Comparison of Proctor penetration resistance for two different needle sizes.

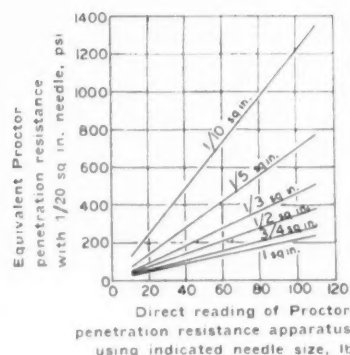


Figure 2. Needle-size correction factors.

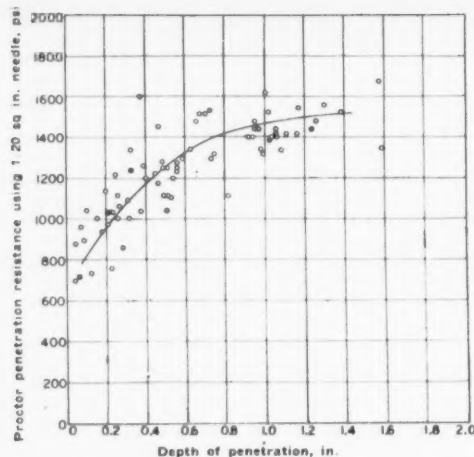


Figure 3. Relation between Proctor penetration resistance and depth of penetration.

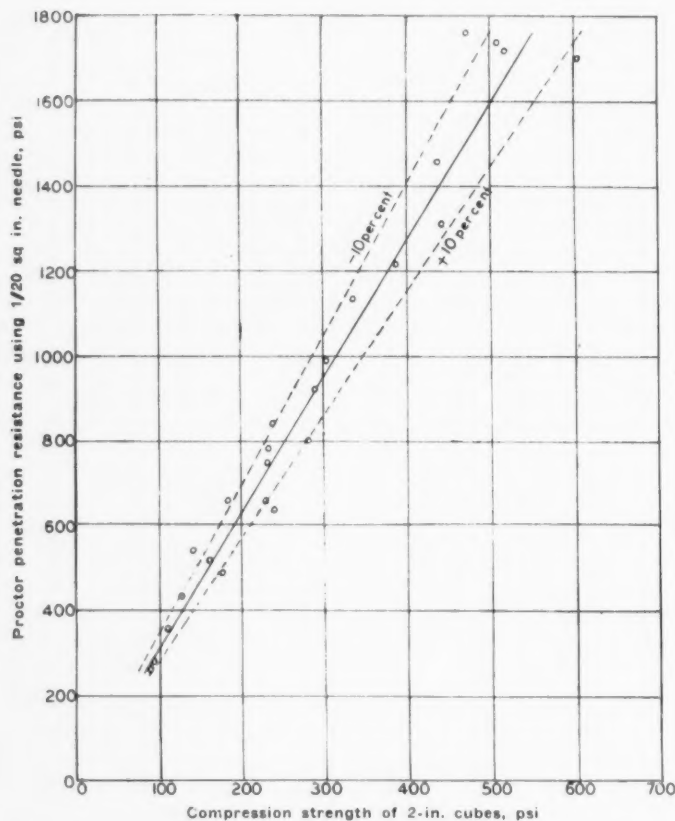


Figure 4. Calibration curve of Proctor penetration resistance versus cube strength for vermiculite concrete.

IN-PLACE STRENGTH TEST

(Continued from page 19)

ure 3 shows a large number of penetrations made in a single slab using the 1/20 sq in. needle. From this graph, it is apparent that penetrations greater than 3/4 in. require only slight increases in the penetration force. A 3/4 in. depth of penetration was selected as the optimum depth for the strength test. The graph in Figure 3 shows that the use of a greater depth might be desirable to minimize errors in the resistance readings due to variations in the measured depth. However, a deeper penetration was not chosen since it requires more manual effort; introduces more side friction on the needle, thus requiring greater alignment control; and finally, a deeper penetration is more likely to hit reinforcing rods sometimes used in lightweight concrete slabs.

Surface condition—Readings were compared on surfaces with a wood float finish against those sanded smooth. The smoothness of the top surface had no effect on the test results. The depth of penetration can be adequately judged using the mark scribed on the needle, regardless of the surface roughness.

Reproducibility—The Proctor apparatus requires manual load application and alignment as contrasted to mechanized loading and alignment with testing machines. To investigate the reproducibility between individual operators, the same slab was tested by five different operators. The results, using procedure previously described, are given in Table I.

Operators, C, D, and E were experienced, while A and B had had less than 5 minutes instruction. It was found, by applying the statistical F test, that the difference between operators was not significant. The mean coefficient of variation for the results of the five operators was 4.3 per cent.

Variability—The best measure of the variability of the results of a test is given by the coefficient of variation of the test data. For the individual cube tests, shown on the calibration curve of Figure 4, the mean coefficient of variation was 7.3 per cent. For the Proctor readings on the same group of slabs, the mean coefficient of variation was 4.7 per cent. This comparison shows that the variability of the Proctor test compares favorably with that of the cube test.

Calibration of results

The compression strength of a 2-in.

Operator	Average of five readings, lb.	Estimated Standard Deviation	Coefficient of Variation, per cent
A	43.0	2.4	0.056
B	43.2	1.9	0.044
C	44.0	1.3	0.030
D	43.2	1.6	0.037
E	46.0	2.3	0.050

Table I. Results of Proctor penetration resistance test of a vermiculite slab with 1/20 sq. in. needle.

cube was chosen for calibration because the cubes could be cut from the same laboratory conditions while the other slab that was used for the Proctor penetrations, thus assuring identical curing conditions. Generally, the test slabs were squares 12 in. on a side and 2 in. thick, cast in forms having wooden sides and steel bottoms which were oiled before using. One half of the slab was used for Proctor penetration tests and the other half was cut into cubes. The cubes were cut in a miter box with a carpenter's crosscut saw and then sanded to the required dimensions on a power sander. They were capped with Celotex pads 1/2 in. thick top and bottom and then tested in a calibrated testing machine.

Figure 4 shows the straight-line relationship between cube and penetration tests. The cube strength is equal to 0.31 times the Proctor penetration resistance in psi. Each point on the calibration curve represents the average of at least five cube tests and five penetrations. All of the concrete for this relationship was the vermiculite type with neutralized vinsol resin as an air entraining agent.

The specimens shown on the calibration curve, Figure 4, represent a wide range of densities and curing conditions, as given in Table II.

Applications of test

The test has been used in the Granco Laboratory for various purposes during the past year. It has been useful for repeated testing of small specimens. The test has proved to be simple for an inexperienced operator to use and gives satisfactory results in a short time. Since it is an in-place, nondestructive test, savings are realized because duplicate specimens do not have to be cast or cut from larger specimens.

A typical use is shown in Figure 5, where the effect of early freezing on low-density concrete is plotted. In this test, one slab was air cured inside under laboratory conditions while the other was placed outside where the temperature was 34° F and falling. The outside specimen reached freezing temperature

		Age, days		
		0 to 7	14	over 21
Moisture condition	Wet	—	3	—
	Air dried	3	7	1
	Oven dried	—	6	4
	21	—	2	—
Density, oven-dry condition, lb per cu ft	27 to 29	3	7	3
	34	—	1	—
	37 to 39	—	6	2

Table II. Test conditions for specimens plotted in Figure 4.

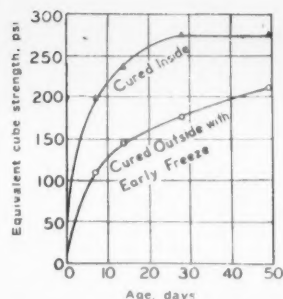


Figure 5. Effect of early freezing on air-cured low-density concrete.

in 4.5 hr and was subsequently subjected to numerous cycles of freezing and thawing. The strength of the exposed slab was measured and compared with the strength of the laboratory slab using the Proctor penetration test to determine the equivalent cube strength.

The Proctor test may be used as an acceptance test for low-density roof slabs. Early age strength measurements of the low-density concrete may be taken on the roof as an estimate of the ultimate strength. The rate of hardening must be considered in the light of prevailing temperatures, type of curing, and type of cement in order to estimate the ultimate strength of the slab.

Conclusions

The Proctor penetration resistance test can be used as a reliable measure of low-density concrete strength. The average of five $\frac{1}{4}$ in. penetrations with the $\frac{1}{20}$ -sq in. needle is recommended. The concrete may be tested at any age from a minimum of about 6 hr and may be tested in place without removing concrete specimens or destroying the slab.

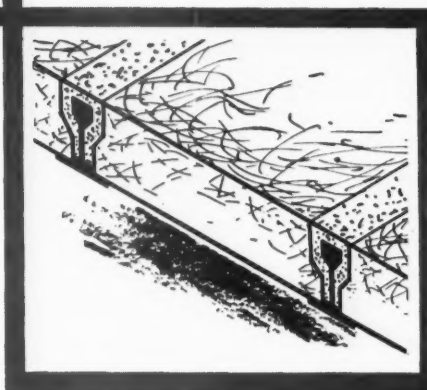
In the development of the strength test it was established that for the low-density concretes:

1. Penetration strength is directly proportional to compressive strength for specimens tested under a wide range of density and curing conditions.
2. Various size Proctor resistance needles cannot be used interchangeably as suggested in the ASTM test, unless correction factors are used.
3. The depth of penetration does not have to be controlled closely.
4. The coefficient of variation for penetration strength measurements is less than that for the cube compression strength measurements.
5. There is no significant difference in the results obtained from different operators.
6. The test is suitable for in-place strength measurements in the field or in the laboratory.

A calibration curve of Proctor strength versus cube strength is needed for perlite and foam similar to the one for vermiculite, Figure 4. The limited data obtained so far indicate that the curve may be similar to Figure 4, but with different proportionality constant.



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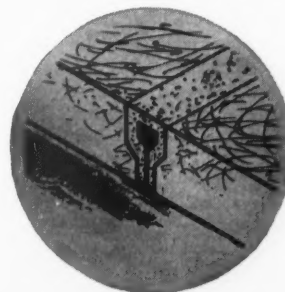
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ENGINEER SHORTAGE AND TESTING PROCEDURES

By John Robinson Davies Engineers and architects are becoming more aware of the importance of engineering testing of the earth's products. The shortage of qualified engineers, however, is creating an increased need for standardization in engineering testing procedures in order to bring about a uniformity in this operation.*

The interest in engineering testing of materials such as soils, concrete and asphalt is ever increasing—on an international scale. More and more engineers, architects, contractors, governmental agencies and similar groups are becoming involved in testing for design and quality control, but there is a definite need for standardization to bring about a uniformity in testing procedures.

Prior to World War II, there were relatively few engineering testing laboratories in existence. During the war period, when structures, roads and airfields had to be constructed rapidly for military purposes, there was little time for trial and error. Many governments rapidly set up testing and control programs which eliminated much of the chance use of construction materials. Those involved in this type of operation during war periods converted these interests to peacetime activity in the years following 1945. It is this period from 1945 to the present which has seen the development of hundreds of new testing laboratories around the world. In fact, from a relatively small number of laboratories in 1945, there are now over 5,000 individual testing laboratories in the world.

Need for standardization

Ten or fifteen years ago, most of the testing operations were performed by graduate engineers. As the work load increased, these engineers supervised technical personnel and now a very high percentage of the engineering testing work is performed by specially trained technicians.

This, alone, has developed the need for standardization in test procedures. With an experienced graduate engineer performing the test, the engineer had complete control over all portions of the test through his knowledge of the theory, method and analysis. The engineer usually carried the entire operation from start to finish, had his own control and was able to make adjustments in his procedures or analysis based on the needs of his specific project.

Current engineer shortage

Today there is a shortage of engineers which makes it impossible to conduct this type of testing program. Much of the work must be delegated to engineering technicians, and the tests must be standardized.

Engineers have been involved in testing concrete for many years and as a result the specifications for this type of work have been pretty well developed. Everyone is familiar, for example, with the standard compression tests of concrete cylinders or cubes, and with the slump test. There are tests for gradation of the aggregate and for quality control of the aggregate.

In the same manner there have been tests standardized for the various physical and chemical characteristics of cement. Concrete, as a manufactured prod-

*Mr. Davies is manager in Europe for Soiltest, Inc.

uct, lends itself easily to standardization in testing.

Concrete tests

In the civil engineering field, concrete tests have recently been performed in the field by concrete producers, architects' representatives, field men and by engineers. These field tests are primarily for determination of quality of the product in meeting a designated specification.

And, around the world there is good uniformity in the standardization of concrete tests. Most countries use the standard slump cone and have specifications which call for the concrete cylinder or cube compression test, the use of yield buckets and control of the aggregate used.

Standardization in soil testing is a different matter. Here, the product is infinitely variable. In most instances, little is known of the materials which are to be used in construction. The classification and knowledge of the physical characteristics of the material must be analyzed through testing procedures before the project is to begin.

Various test methods

The basic tests for soil classification are widely accepted. These include the *Atterberg Limit test* of liquid limit, plastic limit and shrinkage limit. Even though these procedures may not be called for in a national standard in a specific country, the tests are used in almost every country of the world, following perfectly the procedures outlined in the specifications of the *American Society for Testing Materials (ASTM)*.

Another series of tests widely accepted internationally is the *Proctor moisture-density test*. Most countries are using the standardized 1/30 cu. ft. mold and use a standard 5.5 pound hammer which has a 12 inch drop, or the modified compaction hammer of 10 pounds with an 18 inch drop.

The *Proctor Penetrometer*, which is not called out in specification, has been widely used in most countries of the world to develop a correlation between the laboratory compaction studies and the compacted materials on the jobsite.

Use of uniform standards in various countries has made it possible to exchange ideas between research groups and those employing these methods in practical applications. This exchange of information has helped to rapidly advance the knowledge in the field of soil mechanics. And yet there is still so much to be done in the field of standardization of soil testing procedures that it is virtually impossible for any one country to work completely independently in setting its own standards. There is a need for more international cooperation in the development and acceptance of standards for testing soils.

Because of the great variety of tests performed in the field of soil mechanics, the cost of equipping a laboratory is of important consideration. There are a number of manufacturers of soil testing equipment around the world and their prices are geared to the rather high cost of producing specialized apparatus on a low volume basis. With standardization of sizes of testing equipment through the use of international specifications, these manufacturers should be able to reduce

the prices substantially on some of the popular equipment items, and thus put more and more equipment into the hands of the users at lower costs.

Illustrative examples

Several examples will illustrate this point. Years ago when the first commercial production of triaxial equipment was started, it was necessary for some of the manufacturers to decide on specimen sizes that would be used. Two sizes were selected: 1.4 and 2.8 inches in diameter. This selection was based on the type of sampling tube widely used. It was figured that in using a 2 inch outside diameter thin wall sampling tube, a sample approximately 1½ inches in diameter would be obtained. The allowing for some disturbance of the sample due to wall friction and entering into the sampling tube, and trimming the sample down to a size to eliminate disturbance, 1.4 inch diameter was decided as the standard. The same procedure is followed in selecting the 2.8-inch size of sample to be used from a 3-inch outside diameter thin wall sampler.

As a result of these selections, and the fact that sampling tubes of these approximate diameters are widely used around the world, these two sizes of triaxial specimens have become fairly standard internationally. With higher design loads and perfection of many drilling and sampling techniques which enable operators to take lower cost and larger diameter samples, an interest has been developed in triaxial testing of larger specimens. The 4-inch diameter specimen has become almost standard. It will probably be a considerable length of time before the actual testing procedures for triaxial are set up as a standard due to the fact that this is a highly specialized test requiring the experience and judgment of a graduate engineer. However, there can be standardization in specimen sizes and the technique of obtaining samples for actual testing.

In consolidation testing, years ago, the test was performed on samples having a cross sectional area of approximately 100 sq. centimeters (about 4 7/16" in diameter). Then, due to the high cost of taking large diameter samples (a 5½" or 6" diameter sample was required) interest developed in testing smaller diameter specimens. The 2½ inch size was decided upon and this size of specimen is now widely used on consolidation tests in many countries. Because of trimming disturbances on the circumference of the sample and at the top and bottom surfaces, it becomes rather impractical to test smaller diameter consolidation specimens. Here again, the actual operating techniques in consolidation testing would be somewhat difficult to put into a distinct specification since there must be variations in test procedure dependent upon the nature of the specimen, the type of project, etc. But the basic preparation techniques, specimen sizes and the basic concept of loading increments and time duration of increments may be specified.

Because of the wide interest in engineering soil testing, many people who have had no previous experience with soils are becoming involved in quality control on construction projects. This involves compaction and stabilization, identification and the use of special tests

such as the *California Bearing Ratio (CBR)*.

Testing criteria

In any standardization program, the tests most widely used by non engineers, should be developed into a specification. Most sampling operations are performed under the direction of an engineer, but by non technical personnel. The reliability of any test is dependent upon the undisturbed nature of the the sample used. Specifications as to types of samplers, the sizes and the operating technique go a long way toward getting better samples for a test.

Specifications

General specifications as to the methods to be used in classifying soil for strength, color and gradation will help to understand the language of soils. The contractors are interested in performing their own soil investigations and soil tests to assure themselves of the type of conditions they will encounter in construction activities. During actual construction they are further interested in quality control to make sure they will be in full accord with the job specifications, whether or not there is a resident inspector or engineer on the job. The contractor wants to know just when to stop a compaction roller or tamper operation. Each additional hour of operation or each additional pass costs the contractor money and he does not get paid for a higher degree of compaction than that specified.

New specifications should be written in such a way that all interested users of the standard specifications should be able to comply without a great deal of difficulty.

International interest

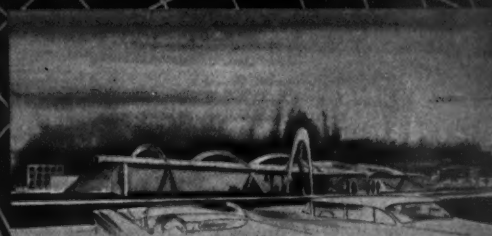
There are a number of international committees presently engaged in working toward uniform international standards. One of the most active committees is that on testing sieves. This group met recently at the Hague, Netherlands to continue its work toward development of an international sieve screen size—getting uniform specifications as to wire diameter, openings (mesh size) and manufacturing tolerances, as well as general sizes of the sieve frames. Some 13 countries are part of this international group and much progress has been made in the development of a new international standard. Copies of a special report and also of the proposed ASTM specification for sieves based on the international proposal are available to those interested.

A great deal has already been done on the international standardization of terms used in soil mechanics. A very excellent dictionary and glossary of soils terms is available through the Swiss Federal Institute as a result of compilations made in conjunction with the 1952 Third International Conference on Soil Mechanics and Foundation Engineering at Zurich.

With engineers engaging in projects in their own and different countries in the world, one sees more and more the need for international specifications.

For example, a project may be designed by a Swiss engineering company, the samples taken by a French drilling contractor, samples tested by a local laboratory, say for a project in an African country, and actual construction performed by an Italian firm of contractors with construction inspection by the original designing engineer. Major projects usually have personnel from many countries involved in the design and construction. This brings about the necessity of testing standards which will be international in character. It will also assist in the more rapid development of the science of engineering testing and will greatly assist in bringing owners, governmental agencies, and civic groups to a knowledge of the fact that testing is an actual necessity of any construction projects whether it be private or public.

EMPHASIS ON FORM for a new generation of consumers



Holiday Lanes, Oklahoma City. Engineer: Calvin L. Garrett, Constructors & Engineers; Industrial Concrete Builders, Inc., Oklahoma City. Now under construction, Holiday Lanes is a masterful combination of contemporary design and imaginative construction methods for a commercial building.

Universally adaptable, infinitely variable, thin shell concrete offers unlimited scope for the designer's imagination. Forming these imaginative shapes, with Tectum form plank, furthers their utility lending warmth and texture to a variety of surfaces.

Tectum form plank, serving first as a forming material, remains in place conforming to curvatures of exciting new roof shapes. The Tectum bonds firmly to thin shell concrete as a permanent exposed surface. Tectum insulates, absorbs sound, eliminates cost of temporary

materials, stripping charges and finishing. Contemporary in appearance, economical to use, Tectum form plank is gaining popular acceptance for all concrete form plank applications.

New Facts About Tectum Form Plank—an informative data sheet, just released, shows how Tectum compliments thin shell concrete construction, provides worthwhile economies in a variety of ways. Ask for Data Sheet CF150 covering the construction details of the Holiday Lanes illustrated above.

WE'VE MOVED

TECTUM CORPORATION
General Offices
535 East Broad Street, Columbus 15, Ohio

Tectum

603

Circle 110 for further information

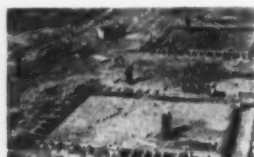
IBEC'S COMPARATIVE CONCRETE TECHNIQUES

Since its founding in 1948, Ibec Housing Corp. has completed more than 5,000 low and medium-priced homes in Puerto Rico, the continental United States and in Iraq and Iran. The majority of Ibec Housing's construction has been in Puerto Rico where the corporation employs two methods it has developed and perfected for the mass production of houses, each making possible the construction of from four

to six homes a day. One, known as the "Ibec Method," was devised by Wallace K. Harrison, FAIA, of New York. This technique for constructing concrete walls utilizes a steel form which is placed, by means of a giant mobile crane, on a previously-prepared floor slab. Concrete is poured into the form, and the next day it is moved to another floor slab. A roof slab, poured in a bed located at the project, is placed

on the walls by the same crane. By using six forms, six houses are produced each working day. Ibec Housing also uses a precast panel method by which the components of a house are cast at centrally-located casting beds, located on trailers, moved to the house site and erected. These two methods are shown here for comparison.

THE IBEC METHOD



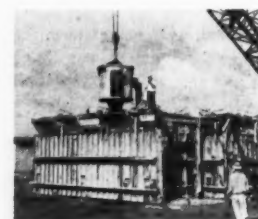
1. Preparations for pouring concrete footings in place for IBEC homes.



2. Reinforcing steel framework put in place prior to being encased in concrete. Complete with electrical conduits and plumbing pipes.



3. 35-ton IBEC method steel form for walls is lowered over framework and footings.



4. Concrete is poured between plates of wall form from mobile "bucket."



5. Form is lifted free of walls after 24-hour period allowed for concrete to harden.



6. Roof slab is vacuum-lifted from casting bed.



7. Crane carries slab to house and places it gently down on house walls.



8. A complete house which sold for \$8,450 when project opened in 1957.

THE PRECAST METHOD



1. Placing of reinforcing steel framework and electrical conduits in a casting bed form for a wall panel.



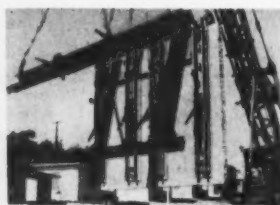
2. Concrete is poured into the form.



3. Vacuum-lifting of wall section from casting bed.



4. Loading of wall panel on to a flat-bed trailer for transportation to house site.



5. Vacuum-lifting of wall section from trailer. It will be placed on house floor slab.



6. Roof panel is brought to house in same manner and put into place.



7. Installation of an aluminum jalousie window frame.



8. Finished IBEC home sold for \$7,350 in 1958.

PRODUCTS, EQUIPMENT, MATERIALS

Report of recent developments by industry, based on data furnished by mfrs. Inquiry cards for further information face pages 1 and 58.



AUDIO SYSTEM FOR TEACHING

MFR'S DESCRIPTION: audio teaching system developed for school use.

USES: teaching of foreign languages, speech improvement, remedial reading, etc.

SPECS/FEATURES: consisting of teacher's console station (above) and students' cubicles, system permits teacher to instruct students individually or collectively, while maintaining full student control. Master console has switches for communication, monitoring, program selection, connectors for tape deck and phonograph and projector sound track. Multi-channel system can be used for more than one foreign language; may be expanded to accommodate two instructors simultaneously. Equipment is transistorized; operates on 12 volts dc.

AIA FILE NO. 31-i-7

MFR: HAMILTON MFG. CO.

Circle 200 for further information

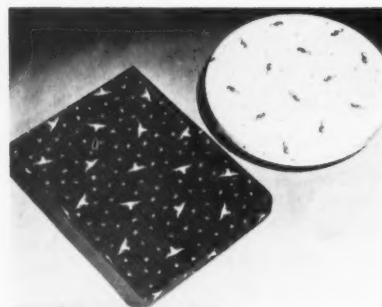


TABLE TOPS AND WALL SURFACES

MFR'S DESCRIPTION: *Accent* line now comprises 12 designs for table tops and 4 patterns for wall surfaces.

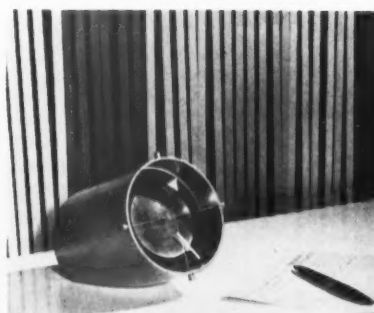
USES: restaurants, hotels, clubs and other commercial establishments.

SPECS/FEATURES: table top line ranges from *Polynesian* and *Rococo* to *Contemporary* and *Modern*, in sizes from 18" in diameter to 24" x 42" rectangles and 36" squares, in laminated plastic. Wall surface line includes *Sirloin* and *Offshore* (shown) for western motif and seafood houses, respectively; *High 'N Dry* for cocktail lounges; and *Tea Time* for restaurants. Mfr claims patterns are dramatic, different and exclusive.

AIA FILE NO. 35-C-12

MFR: FORMICA CORP., SUBS., AMERICAN CYANAMID CO.

Circle 201 for further information



UNUSUAL DESIGNS FOR CLOCKS

MFR'S DESCRIPTION: over a dozen models available in *Motion Notion* clock designs, created by George Nelson.

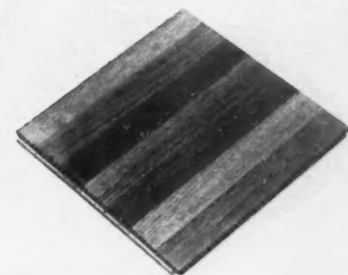
USES: various office and residential uses.

SPECS/FEATURES: designs utilize spatial values and geometric designs of vacuum-formed plastic; colored, revolving disks express time values. Adaptable for wall hanging, hanging from ceiling as mobile and mounting on desks, tables, etc. *Clocknick*, \$60, (shown) is sawed-off cylinder of brass and chrome, having recessed face, revolving dial and tautly stretched wires marking major face divisions; designed for use on desk or table. Other models include: *Kaleidoscope*, hexagonal shadowbox with mirrored facets and revolving face; and *Floating Mine*, two-faced sphere, bristling with red birch pointers, for ceiling suspension. Units are electric and available for eight-day wind. Approximate retail prices range from \$45 to \$80.

AIA FILE NO. 35-N-4

MFR: HOWARD MILLER CLOCK CO.

Circle 202 for further information



FLOOR TILES OF HARDWOOD

MFR'S DESCRIPTION: *Hartco Wood Flor-Tile*, hardwood flooring material, now available in tile form.

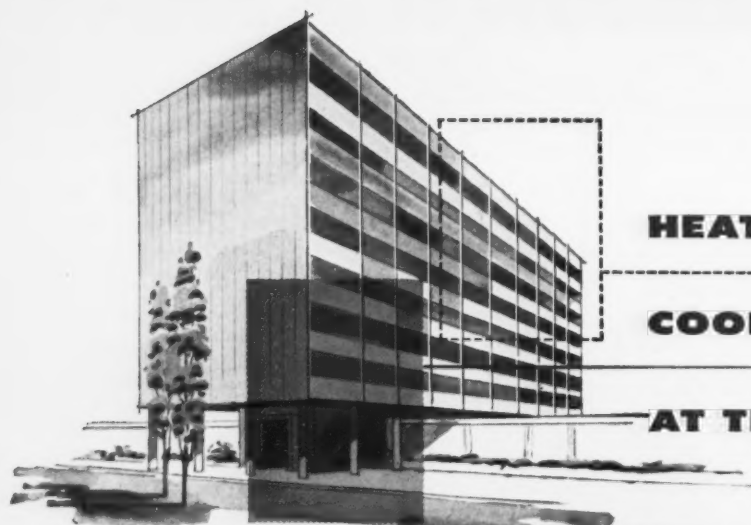
USES: numerous floor covering applications.

SPECS/FEATURES: reported to be priced competitively and applied easily. Units described as pre-finished; require only regular waxing. Features stressed: (1) pre-finish of infra-red baked urea melamine, unaffected by alcohol, oil and grease; (2) adhesive installation, provided by two mastics; (3) quartering to give tile lower expansion coefficient. Strips are assembled into blocks by knurled wires, enabling breaking off strips around room edges, thereby eliminating much cutting and fitting. Units are 6" square, 5/16" thick. Available in premium and natural grades of oak, hard maple, white ash and black walnut.

AIA FILE NO. 19-E-9

MFR: TIBBALS FLOORING CO.

Circle 203 for further information



HEAT ONE SECTION

COOL ANOTHER

AT THE SAME TIME

McQuay

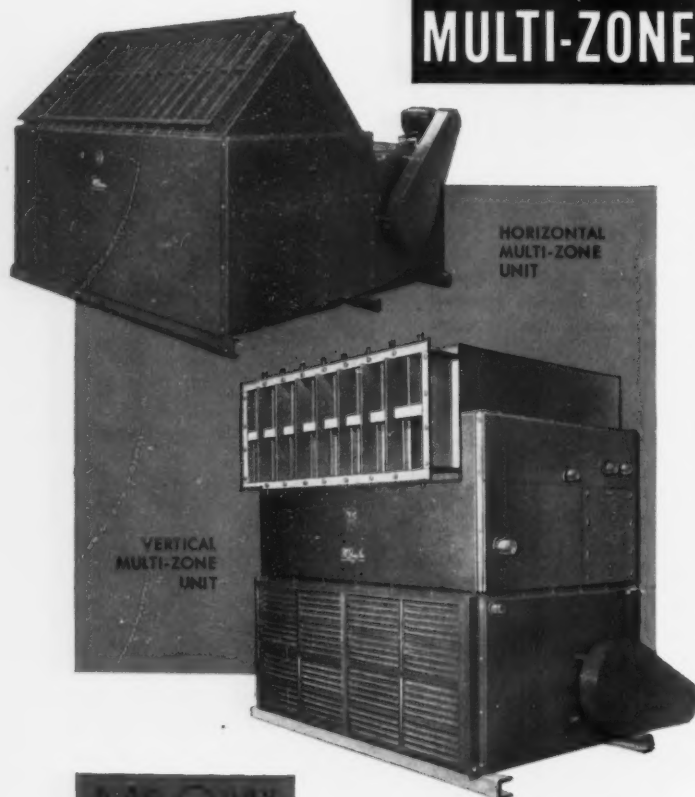
MULTI-ZONE

AIR CONDITIONERS

You choose your own weather with McQuay "MC" Multi-Zone air conditioners—even to heating some sections of a building while you cool others. You can furnish balanced comfort simultaneously to different, determined areas with either filtered, cooled and dehumidified air; or filtered, heated humidified air—or a mixture of these in any desired proportion—at your command.

McQuay "MC" Multi-Zone air conditioning units are available in 11 sizes from 1370 cfm to 38,000 cfm. Each unit has a standard number of zones available from 6 on the smallest to 22 on the largest. All zones are interconnected by a single external connecting rod. A full line of accessories is available . . . preheat steam coils, filter sections, mixing boxes, humidifiers.

McQuay "MC" units, of course, feature the famous McQuay Ripple-Fin coils for highest efficiency and Dura-Frame "V" channel construction for strength and rigidity. When you use McQuay, you can be sure that engineering research and know-how have produced the finest, most efficient and dependable equipment available. McQuay, Inc., 1669 Broadway Street N.E., Minneapolis 13, Minnesota.



McQuay
Means Quality

McQuay INC.

AIR CONDITIONING • HEATING • REFRIGERATION



Circle 111 for further information

PRODUCTS, EQUIPMENT, MATERIALS

DECORATIVE REINFORCED PLASTIC PANEL

MFR'S DESCRIPTION: development of low-cost, decorative, fibrous glass reinforced plastic panel announced.

USES: room dividers, shoji screens, table tops, luminous ceilings, etc.

SPECS/FEATURES: available 48" x 144". Features random pattern of multi-colored leaves, butterflies, etc., against frost background. Suggested retail price is \$.69 psf.

AIA FILE NO. 26-A-5

MFR: FILON PLASTICS CORP.

Circle 204 for further information

VINYL FABRIC LINE EXPANDED

MFR'S DESCRIPTION: *Contessa* pattern added to *Victrex* VEF line of vinyl wall covering and upholstery fabrics.

USES: upholstery and wall covering.

SPECS/FEATURES: pattern features sculptured, bas-relief effect in floral and other patterns. Said to last indefinitely, maintain fresh appearance and wipe clean with damp cloth. Available in 14 colors.

AIA FILE NO. 28

MFR: L. E. CARPENTER & CO., INC.

Circle 205 for further information

ACCESSORIES FOR SWIMMING POOLS

MFR'S DESCRIPTION: line of swimming pool accessories offered, featuring safety, durability, approved design and economy.

USES: pools of assorted sizes.

SPECS/FEATURES: line includes: one-meter and three-meter diving boards of Douglas fir laminated construction, said to meet AAU and NCAA requirements; boards of aluminum for installations subject to heavy use; lifeguard chairs; pool cleaning equipment; lifelines; lifebuoys; and water slides. Latter are offered in conventional sizes, 12', 16' and 20' long, with platforms 6', 8' and 10' high.

AIA FILE NO. 35-F-2

MFR: AMERICAN PLAYGROUND DEVICE CO.

Circle 206 for further information

EXITWAY FOR PASSENGER CONVEYORS

MFR'S DESCRIPTION: exitway for passenger conveyor belt systems developed, stressing safety and ease of entry and departure.

USES: moving stairway applications in commercial, institutional and other public buildings.

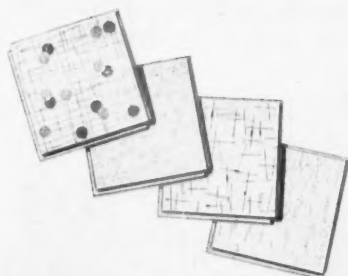
SPECS/FEATURES: developed in cooperation with Goodyear Tire & Rubber Co., exitway utilizes "floating

comb" plate comprising tiny fingers which ride in grooves of ribbed conveyor belts and "comb out" objects, such as women's spiked heels, which tend to be caught. White rubber strips, 1", are inlaid across belt to provide visual suggestion that unit is moving.

AIA FILE NO. 33-E-1

MFR: SPEEDWALK DIV., STEPHENS-ADAMSON MFG. CO.

Circle 207 for further information



ACOUSTICAL TILES FOR CEILINGS

MFR'S DESCRIPTION: four ceiling tile-boards introduced.

USES: acoustical and decorative applications on ceilings.

SPECS/FEATURES: *Grecian* and *Qui-Lite* are acoustical tileboards with surfaces of various sized holes, intended to act as sound traps. Offered in white, in sizes 12" x 12" and 12" x 24" (center grooved) with flanged tongue and groove joint. *Fantasy* and *Pageant* are decorative tileboards, 12" x 12", with tongue and groove joint. All units stated to be easily cleaned.

AIA FILE NO. 39-B

MFR: INSULITE

Circle 208 for further information



INSTRUMENT FOR SOIL PERMEABILITY

MFR'S DESCRIPTION: *Plastic Permeameter* announced, for use in soils and aggregate laboratories for fast determinations of permeability and

for observation of quicksand phenomena.

USES: testing sands, gravels or mixtures of both, by architects, engineers and laboratories involved in research, education and routine testing.

SPECS/FEATURES: can also be used for small scale tests on graded filters for dams, filtration plants and drains. Transparent plastic construction of unit enables operator to observe soil and water flow during test. Tank has 2 1/2" internal diameter and accommodates 10" high specimen. Overall height is 14". Supplied with accessories including piezometer tubes and fittings for inlet and outlet of water.

AIA FILE NO. 38-B

MFR: SOILTEST, INC.

Circle 209 for further information



AUTOMATIC SYSTEM FOR PARKING

MFR'S DESCRIPTION: automatic parking system devised to enable installation of equipment on lot no more than 25' wide.

USES: parking in congested areas.

SPECS/FEATURES: recent system said to make possible lateral and longitudinal parking. Standard units may be installed side by side, back to back or in such geometrical fashion as location and plot area, shape and topography dictate. Only standard steel construction members are needed to erect system, mfr states. Mfr claims site which now parks 30 cars can park 200 cars with this system, built 10 tiers high. A 200-car garage can be emptied in 40 minutes with only two attendants.

AIA FILE NO. 38-L-1

MFR: ELECTROMATIC AUTOPARKS, INC.

Circle 210 for further information

FURNITURE/CERAMICS

TRANSLUCENT CERAMICS IN COLOR

MFR'S DESCRIPTION: original designs offered in translucent ceramic material.

USES: windows, room dividers, cur-

tain walls, interior panels, etc.

SPECS/FEATURES: applications stated to be almost limitless. Mosaics are joined together as unit, without lead or other division to create interesting light and color effects. Mfr claims variations of technique and countless unique creations are possible.

AIA FILE NO. 23-A

MFR: SAXON MOSAICS

Circle 211 for further information



CHAIR LINE HAS CANTILEVER ARMS

MFR'S DESCRIPTION: *Criterion* line of steel office chairs introduced, featuring sturdy construction and swept-back cantilever arms.

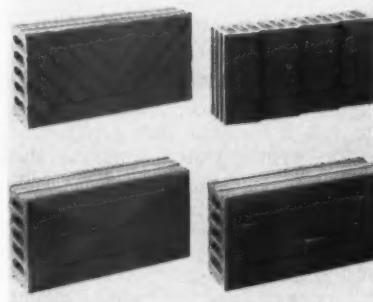
USES: office use.

SPECS/FEATURES: available in wide range of upholstery fabrics, leather and plastics, colors and metal finishes, line includes arm swivel chair (shown) armless swivel chair, arm side chair and armless side chair. Cantilever arms said to eliminate forward supports leaving front and sides of chair seat unobstructed, giving freedom of leg movement. Seat cushions and backs are molded foam rubber.

AIA FILE NO. 35-H-41

MFR: HARTER CORP.

Circle 212 for further information



SCULPTURED STRUCTURAL CERAMIC TILE

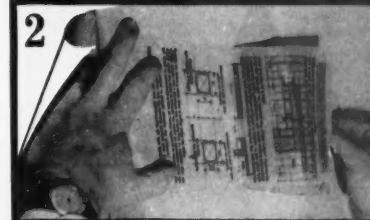
MFR'S DESCRIPTION: development announced of series of sculptured,

THIS IS THE CORRECT EASY WAY



PEEL

the STANPAT from its backing.



PLACE

the STANPAT into position on the tracing.



PRESS

into position... will not wrinkle or come off.

Don't chain your engineers to time-consuming routine on repetitive blueprint items... free them for more creative work and save countless hours of expensive drafting time with STANPAT.

STANPAT prints these items on tri-acetate sheets that are easily transferred to your tracings. No special equipment required... reproductions come out sharp and clear... and STANPAT is incredibly inexpensive.

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☐ Please quote on enclosed samples.
Kindly send me STANPAT literature and samples. Dept. 179

Name _____

Title _____

Company _____

Address _____

Circle 112 for further information

PRODUCTS, EQUIPMENT, MATERIALS

glazed structural ceramic tile.

USES: decorative applications.

SPECS/FEATURES: designed to permit versatility of design as decorative inserts or for overall patterns and textures. Four basic patterns (shown) currently available in varied colors and glazes, 8" x 16".

AIA FILE NO. 23-A-2

MFR: STARK CERAMICS, INC.

Circle 213 for further information



OFFICE FURNITURE IN NATURAL WALNUT

MFR'S DESCRIPTION: line of office furniture introduced, featuring natural walnut surfaces set off by brushed metal legs and handles.

USES: office installations.

SPECS/FEATURES: *Embassy* line has top surfaces protected by laminated material called *Daponite* which can be applied over natural wood finishes. Mfr claims finish resists charring from cigarettes and staining from water, coffee and alcohol; may be cleaned with damp cloth. Line, of modular construction, includes double and single pedestals, conference tables, credenzas and chairs.

AIA FILE NO. 35-H-41

MFR: MURPHY-MILLER, INC.

Circle 214 for further information

CONCRETE/CEMENT

LIQUID SEALER AS MAINTENANCE AID

MFR'S DESCRIPTION: *Lastek 33*, rubberized liquid sealer for repairing cracks in asphalt and concrete pavements, announced.

USES: cracks less than 3/8" wide.

SPECS/FEATURES: mfr states product: prevents water penetration and subsequent freeze-thaw damage; increases pavement service life; and enhances appearance. Also claimed to be ideal for sealing floors and parking decks against crack leakage. Applied by pouring from small nozzle cans or cones. Contents of 1 qt bottle will seal 100 lineal ft of cracks 1/8" wide by 3/8" deep, according to mfr.

AIA FILE NO. 7-D

MFR: MAINTENANCE, INC.

Circle 215 for further information

PRIMER FOR CEMENT SURFACES

MFR'S DESCRIPTION: *Poly-Fil*, fill coat primer for sealing and waterproofing, announced.

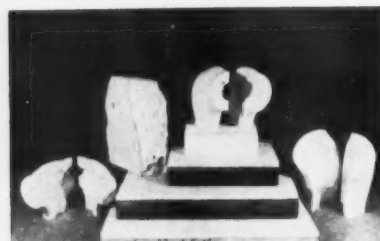
USES: on concrete block, masonry, stucco and other surfaces.

SPECS/FEATURES: reportedly provides uniform, smooth surface with exceptional durability. Mfr's tests show interior moisture is drawn through coating in form of vapor, eliminating possibility of trapped moisture causing coating to blister or peel. Maximum resistance to oxidation and erosion also claimed.

AIA FILE NO. 3-B

MFR: MATHEWS PAINT CO.

Circle 216 for further information



CASTABLE CEMENT FOR THERMAL INSULATION

MFR'S DESCRIPTION: castable, quick-set, one-coat insulation cement, introduced, featuring re-use of set or dried material.

USES: on materials usually difficult to cover, such as fibrous glass board and blanket, foam glass block and rock wool blanket.

SPECS/FEATURES: can be applied to materials without use of hex wire, according to mfr. Said to withstand freezing with no deteriorating effects, be non-rusting and non-corrosive to metal and materials, especially aluminum. Mfr claims pre-molded jackets for pipe fittings of any size can be made in two pieces and be easily applied. Uniformity and durability also stressed.

AIA FILE NO. 37-D-3

MFR: THERMOLD PRODUCTS CO.

Circle 217 for further information

GRINDER FOR CONCRETE SLABS

MFR'S DESCRIPTION: *Model JR* added to line of concrete slab grinders.

USES: grinding dry concrete slab, rain pitted slab, joints, high spots and ridges; also to remove trowel marks and surplus concrete.

SPECS/FEATURES: powered by 3/4 hp, 110/220 volt ac motor; counter-rotating twin discs in neoprene mountings provide torque-free operation, according to mfr. Weight is less than 100 lbs; grinding area is 112 sq in; six 1 x 2 x 3 grinding stones

used. Overall height of unit is 37", with width of 15" and overall length of 19 1/2".

AIA FILE NO. 4

MFR: EQUIPMENT DEVELOPMENT CO.

Circle 218 for further information

ELECTRIC DRILL HAS VARIABLE IMPACT

MFR'S DESCRIPTION: variable impact electric drill developed; reported capable of sinking 3/4" hole 3" deep in concrete in 180 seconds.

USES: building and maintenance.

SPECS/FEATURES: unit is 18" long and weighs 10 1/2 lbs. Stated to be as

effective with carbides from 1/2" to 1 1/8", as with concrete. Unit's adjustable feature, in addition to preventing carbide breakage, also permits controlled impact drilling of hollow tile and similar materials, according to mfr. Drill is powered by 4 amp heavy-duty motor which operates on 115 v dc or ac, 60 cycles or less. Generating assembly is machined of aircraft alloy-steel, hardened to C60, to assure trouble-free service indefinitely, mfr claims.

AIA FILE NO. 36-H

MFR: MOORHEAD-CREGO, INC.

Circle 219 for further information

2 BUBBLER BEAUTY



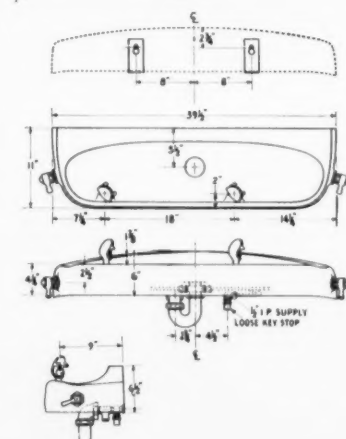
HAWS MODEL 10F

IN COLORFUL FIBERGLASS



An accent of color with the graceful sweep of clean design—that's the new HAWS 2-bubbler Model 10F! Patterned after the popular Model 10Y (3-bubbler fiberglass model), this tough, vacuum molded fiberglass plastic unit is equipped with HAWS exclusive anti-squirt, vandal proof fountain heads. All visible trim is chrome plated. Select white or any of five decorator colors at no extra cost.

For details on HAWS' full line, write for the latest catalog—or check your Sweets File.



HAWS

DRINKING FOUNTAINS

Products of HAWS DRINKING FAUCET COMPANY
1441 Fourth Street, Berkeley 10, California
Export Dept.: 19 Columbus Ave., San Francisco 11, California

Circle 113 for further information

Architectural & Engineering News

DRILLING METHOD FOR CONCRETE

MFR'S DESCRIPTION: *Method A* announced as faster, cleaner, less expensive method of dry-drilling reinforced concrete.

USES: drilling in areas where dust and noise would be prohibitive, e. g., hospitals, food processing areas, hotels and other institutions.

SPECS/FEATURES: method incorporates bits, dust exhaust swivel, power unit and dust collector. Method of removing dust and steel cuttings from hole said to reduce heat, friction and noise to minimum. Drilling machine used is portable; requires no bracing or fastening to walls or floors and can be adapted to any drilling problem, according to mfr. Fast operation is stressed.

AIA FILE NO. 35-i-25

MFR: NEW ENGLAND CARBIDE TOOL CO., INC.

Circle 220 for further information

COLORED COATING FOR ASPHALT

MFR'S DESCRIPTION: *Vynatex 23* is colored coating to protect and improve appearance of asphalt pavements.

USES: recommended applications include entrances, walks, parking lanes, patios, recreational areas, railway and bus platforms, industrial areas, gasoline stations and others.

SPECS/FEATURES: available in grass green, concrete gray and brick red; attractive appearance stressed. Mfr states material, through light reflection and absorption, contributes to reduction of illumination problems and lighting costs. Colors stated to be non-fading; material is claimed to guard asphalt surfaces against oxidation, drying action of sun and freeze damage.

AIA FILE NO. 11

MFR: MAINTENANCE, INC.

Circle 221 for further information

DOORS/SIDING

STRIATED SIDING WITH CERAMIC FINISH

MFR'S DESCRIPTION: *Ceramo* is recently developed striated clapboard for residential building and remodeling.

USES: exterior siding applications.

SPECS/FEATURES: striated material available in white, colonial yellow, birch gray and sage green. Ceramic finish is baked on; can be washed with household detergents, according to mfr. Also stated to offer resistance to fire, termites and rot. Material is 9 1/3" by 48", weighs 186 lbs per square and numbers 36 pieces per square.

AIA FILE NO. 19-D-2

MFR: PHILIP CAREY MFG. CO.

Circle 222 for further information

Circle 114 for further information →

"Holophane is to be congratulated..."

ATLAS POWDER COMPANY

expresses high satisfaction with their new lighting system. When Atlas designed the relighting of their Central Engineering Department, Holophane Specification No. 7559-C showed how to provide 170 foot-candles maintained illumination.



ATLAS POWDER COMPANY

WILMINGTON DD, DELAWARE

November 13, 1959

Mr. C. C. Keller
Holophane Company, Inc.
342 Madison Avenue
New York 17, New York

Dear Mr. Keller:

We have completed the installation of the Holophane Fluorescent Lighting System, designated as 6404-64, in our Central Engineering Department. The maintained illumination level is 170 foot candles.

The installation has proved very satisfactory from the visual comfort and the illumination level. The graceful styling lends itself beautifully to our surroundings with particular reference to the shallowness of the unit.

Holophane is to be congratulated in designing such a unit from the mechanical and electrical angle. With the ballasts mounted at far sides and opposite corners, it provides cooler and safer operation together with a better weight distribution with respect to installation.

The unit is constructed in such a manner that all parts are readily accessible from an installation and maintenance standpoint. It is our opinion that we cannot offer any constructive criticism or suggestion in order to make this a better unit.

Very truly yours,

ATLAS POWDER COMPANY

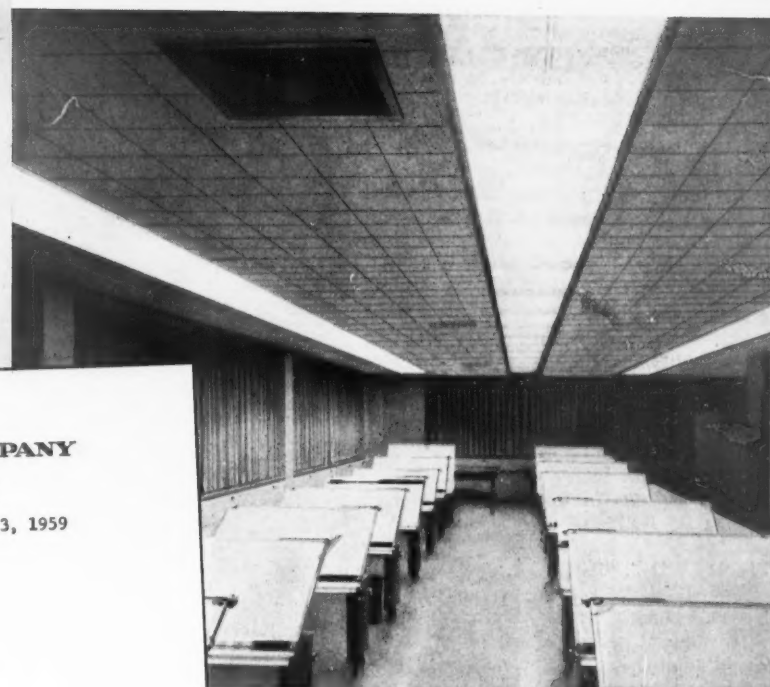
CENTRAL ENGINEERING DEPARTMENT
TECHNICAL SERV. SECTION

R. G. Rudrow
R. G. RUDROW, MANAGER
ELECTRICAL GROUP

RGR:ms

HOLOFLUX®—Recessed 2 Foot Wide Luminaire,
featuring PRISMALUME® (Prismatic Acrylic Plastic)

No. 6400—Holoflux with prismatic border; in four foot lengths or continuous runs...Distinctive design integrates with contemporary interiors...Prismatic construction provides highest utilization of light, minimum brightness.



Central Engineering Dept., Atlas Powder Company.
Installed by Hatzel and Buehler, Inc.

The entire Holophane organization—particularly the engineers and craftsmen responsible for the development of Holoflux units—is gratified to acknowledge the plaudits from Atlas Powder Company... Recognition of sincere endeavor spurs greater effort and further accomplishment.

HOLOPHANE COMPANY, INC.

Lighting Authorities Since 1898

342 Madison Ave., New York 17, N. Y.

THE HOLOPHANE CO., LTD., 418 KIPLING AVE. SO., TORONTO 18, ONT.



PRODUCTS, EQUIPMENT, MATERIALS

RIGID PANELING WITH PLASTIC SURFACE

MFR'S DESCRIPTION: *Marlite Korelock*, rigid, hollow-core paneling with decorative baked plastic surface, available in six *Trendwood* finishes and ten other colors.

USES: panels for wall or ceiling use.

SPECS/FEATURES: available in 2' x 8' panels. Panels combine two sheets of tempered hardboard and interlocking wood core; face of panel has permanent finish while back is sealed and baked. Described as rigid and self-aligning, for application directly over open framing or furring.

AIA FILE NO. 19-E-6

MFR: MARSH WALL PRODUCTS, INC.

Circle 223 for further information

EXTERIOR PAINT GRADE DOOR

MFR'S DESCRIPTION: *Duraply* exterior paint grade door, flush door with paint surface overlay said not to face check, introduced.

USES: exterior door applications.

SPECS/FEATURES: outer faces are overlaid with waterproof and abrasion-resistant material; high phenolic resin content gives added protection from elements, mfr claims. Available in two styles: staved lumber core construction with core of kiln-dried wood blocks; and *Stay-Strate* construction with incombustible mineral core. Mfr states one prime and two finish coats of paint can last four to five years, minimizing decorating and maintenance costs.

AIA FILE NO. 19-E

MFR: U. S. PLYWOOD CORP.

Circle 224 for further information

ADDITIONAL THICKNESSES FOR STOCK PANELS

MFR'S DESCRIPTION: production of *Graco Flakecore* expanded to include thicknesses up to 1 3/16".

USES: plastic underlayment, restaurant tables, wall partitions, core for wood veneer, etc.

SPECS/FEATURES: panels are offered up to 5' x 10'. Mfr states solid strength is assured by 100 per cent homogeneous flakes, having a modulus of rupture of 3800 psi and density of 38 lbs pcf, for less weight.

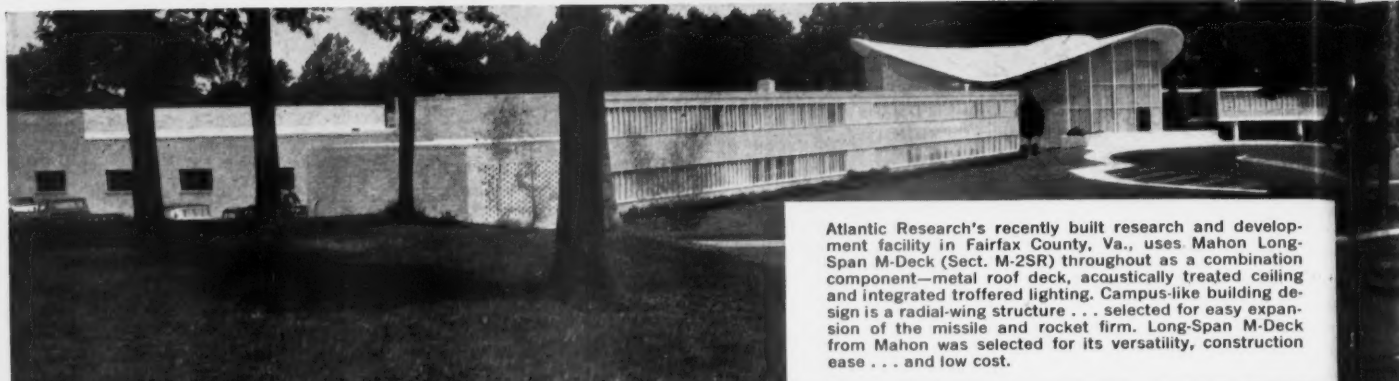
AIA FILE NO. 19-E

MFR: GRAY PRODUCTS CO., INC.

Circle 225 for further information

INDUSTRIAL DOOR OF STEEL

MFR'S DESCRIPTION: industrial turn-over door announced, featuring speed



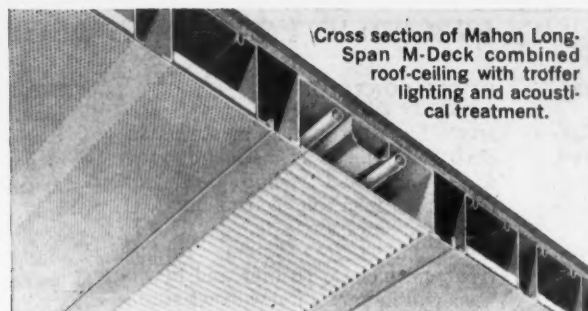
Atlantic Research's recently built research and development facility in Fairfax County, Va., uses Mahon Long-Span M-Deck (Sect. M-2SR) throughout as a combination component—metal roof deck, acoustically treated ceiling and integrated troffer lighting. Campus-like building design is a radial-wing structure . . . selected for easy expansion of the missile and rocket firm. Long-Span M-Deck from Mahon was selected for its versatility, construction ease . . . and low cost.

MAHON MULTI-USE LONG-SPAN M-DECKS



Interior view of one of Atlantic Research's engineering sections showing ceiling side of Mahon Long-Span M-Deck—attractive, functional and noise proofed. Troffer lighting M-Deck sections harmonize with surroundings—provide diffused, glare-free illumination.

Circle 115 for further information



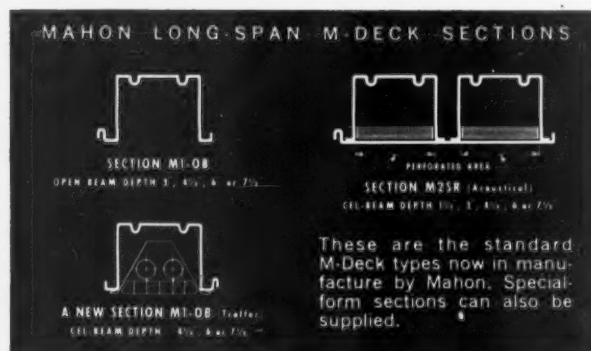
Cross section of Mahon Long-Span M-Deck combined roof-ceiling with troffer lighting and acoustical treatment.

Today, more than ever, architects and engineers are depending on Mahon Long-Span M-Decks as proven, multi-purpose roof sections that provide a combined structural roof deck and ceiling. Now, for less cost than once required for conventional steel roof systems, you can also specify functional ceilings that fit into almost any job.

short-cuts to quality construction —long strides toward cost reduction

These steel sections give you more design and construction advantages . . . (1) adaptability: serving as structural members, roof decks, finished ceiling material—even acoustical treatment; (2) efficiency: high strength-to-weight ratio permits spans from wall-to-wall or truss-to-truss . . . roof beams and purlins can be eliminated; (3) economy: easy handling, fast erection, rapid covering—saving time, labor and material; and (4) flexibility: producing either flat or beamed ceiling surfaces with or without recessed troffer lighting or acoustical treatment, in metal gages and gage combinations to suit your need.

Find out what quality-made Mahon Long-Span M-Decks can do for you . . . your work . . . your costs by talking with your local Mahon architectural representative, consult Sweet's Files or write for information Catalog LSD-60.



MAHON

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- Aluminum or Steel Curtain Walls (in natural or colored metals)
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- Long Span M-Deck (Cellular or Open Beam)
- Steel Roof Deck
- Acoustical and Troffer Forms
- Acoustical Metal Walls, Partitions and Roof Decks
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SPEEDING AMERICAN CONSTRUCTION WITH METAL BUILDING PRODUCTS, FABRICATED EQUIPMENT AND ERECTION SERVICES

PRODUCTS EQUIPMENT MATERIALS

of operation, elimination of overhead tracks and improved weather tightness.

USES: bus, railroad, plant and warehouse openings.

SPECS/FEATURES: unit is all steel two leaf tubular turnover door, available in sizes ranging from 10' x 10' to 3' x 22'. Head room above soffit reduce to 12" by elimination of overhead tracks. Jamb width required between adjacent doors is 12", according to mfr. Reportedly designed to withstand wind loading of 20 lbs per sq ft. Safety device also contained, actuate by either vertical or horizontal contact with obstruction in door's path.

AIA FILE NO. 16

MFR: BYRNE DOORS, INC.

Circle 226 for further information

FIRE-RESISTANT PANELS IN WASHABLE COLORS

MFR'S DESCRIPTION: three panel with HT-60 finish in color, now available.

USES: institutions, industrial and commercial buildings.

SPECS/FEATURES: available in aqua white, tan and 9 color variations. Surface is obtained by fusing color to asbestos cement board through heat treating process, according to mfr. Panels said to incorporate fire resistance and other advantages of asbestos cement board, in addition to colored, washable surface. Described as impervious to water and alkali, acid resistant and able to withstand weathering effects. On model is insulated.

AIA FILE NO. 23-L

MFR: ALLIANCEWALL, INC.

Circle 227 for further information

SOUND/COMMUNICATIONS

STEREO HIGH FIDELITY AND RADIO UNITS

MFR'S DESCRIPTION: line of stereo high fidelity Victrola and AM-FM radio units offered.

USES: home entertainment equipment, designed for recessed mounting in walls and room dividers.

SPECS/FEATURES: BK-1 is phono graph unit, featuring walnut or cherry veneers; dual amplifier produces 18 watts of maximum musical power, according to mfr. BK-2 is deluxe version with AM-FM tuner features push button controls and dual amplifier to produce 58 watts—available in 2 finishes. Record changers are housed in sliding cabinets; available in 4 speeds.

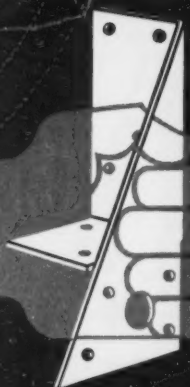
AIA FILE NO. 31-i-6

MFR: RADIO CORP. OF AMERICA

Circle 228 for further information

Circle 115 for further information

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Circle 116 for further information

32

COMMUNICATION SYSTEM FOR LANGUAGE LABORATORY

MFR'S DESCRIPTION: electronic language laboratory, *Medallion*, offered, with transistorized components.

USES: educational language laboratories applications.

SPECS/FEATURES: system, mfr states, can be expanded in both number of student positions and in instructional level. Designed especially for teaching of languages, system includes instructor's console, student booths and electronic components necessary for effective teaching. Equipment is modular to aid future expansion and modification. Features include high standards for voice fidelity, transistorized circuits, plug-in components and simple environment for maximum learning.

AIA FILE NO. 31-i-7

MFR: DUKANE CORP.

Circle 229 for further information



POCKET-SIZED UNIT FOR COMMUNICATION

MFR'S DESCRIPTION: *Electropage* is recently developed system for communicating with one or more individuals instantly and confidentially in any type of building.

USES: in hospitals, offices, plants and such institutions as schools.

SPECS/FEATURES: system reportedly eliminates wires, bells, buzzers and public address systems; cost per channel is \$230, including installation. Up to 500 channels now available. Each individual carries miniature receiver, weighing 8 oz and measuring 1" thick, 2 3/4" wide by 4 3/4" long. Operator can immediately contact any individual. Receivers feature automatic action, low voltage and high sensitivity. Emergency calls may be made to all receivers.

AIA FILE NO. 31-i-51

MFR: UNITED STATES COMMUNICATIONS, INC.

Circle 230 for further information

PRODUCTS, EQUIPMENT, MATERIALS

ROOM CONTROL SYSTEM DEVELOPED

MFR'S DESCRIPTION: room status indicator developed as method of room control, intended to eliminate human error and resulting confusion.

USES: hotels of any size.

SPECS/FEATURES: system enables front office clerk, cashier and housekeeper to instantly know exact status of each room in hotel. Utilizes series of colored lights on control boards to indicate to those concerned when rooms are occupied, unoccupied, ready for occupancy, etc. Mfr states system is instantaneous, noiseless, fool proof and doesn't tie up other internal communications apparatus. Also, is easy to operate, durable and requires almost nothing to operate and maintain.

AIA FILE NO. 31-i

MFR: AMERICAN COMMUNICATIONS CORP.

Circle 231 for further information

KITCHEN UNITS

STAINLESS STEEL CABINET SINK TOPS

MFR'S DESCRIPTION: *Carlton* stainless steel cabinet sink tops added to sink line.

USES: residential installation.

SPECS/FEATURES: units offered in all standard sizes and models, ranging from single bowl models for efficiency apartments to double bowl models with drain board on both sides. All are of 18 gauge, type 302, 18-8 chrome-nickel stainless steel, electrically welded to provide flush seams. Fourteen models available.

AIA FILE NO. 29-H-6

MFR: CARROLLTON MFG. CO.

Circle 232 for further information

COMPACT UNIT FOR KITCHENS

MFR'S DESCRIPTION: utility, versatility and convenience are claimed for compact kitchen unit which incorporates stove, sink and refrigerator. USES: limited space kitchen applications.

SPECS/FEATURES: unit features magnetic gasket door to insure tight seal, and plastic inner door liner with three shelves for storage of bottles, dairy products, etc. Dimensions are 30" wide x 24" deep x 36" high. Available with two burners, either gas or electric, 17" stainless steel sink and 5 cu ft refrigerator with freezer compartment.

AIA FILE NO. 35-C-11

MFR: KING REFRIGERATOR CORP.

Circle 233 for further information

Look!
moldings
that
match

*in colors
and patterns
of all plastic
surfacing
materials*



Kalwood Matching Moldings are made of aluminum — with a thin, durable, matching veneer of wear-resistant plastic, permanently bonded to exposed surfaces. ALL patterns can be matched in Formica, Pionite, Panelyte, Consoweld for any surfacing material.

Since Kalwood moldings allow for settling and contraction, you never have to worry about buckling, curling, or joint separation. Available in shapes to meet every trim requirement. Write for descriptive literature. Keller Products Inc., 43 Union St., Manchester, N. H.

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Circle 117 for further information

Architectural & Engineering News

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off the floor,
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models —
3 to 27 G.P.H.



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bottle models —
also hot and cold.

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2432

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Circle 118 for further information

May 1960

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REFRIGERATOR OCCUPIES LESS SPACE

MFR'S DESCRIPTION: Model SS-4SC unit developed; described as space saving, self-contained refrigerator. **USES:** wherever space is at a premium.

SPECS/FEATURES: mfr states unit is fully insulated with 3" of high density fibrous glass to insure against leakage and prevent moisture from entering. Features include: automatic evaporation system; temperature control thermostat; overlap type doors for greater capacity; and capillary type refrigeration system to eliminate need for adjusting valves. Exterior is stainless steel; interior available in aluminum or stainless steel. Standard size is 24" wide x 35 3/8" high x 24" deep, with interior of 18" x 18" x 26".

AIA FILE NO. 30-F-6

MFR: SILVER REFRIGERATION MFG. CORP.

Circle 234 for further information



VENTILATING HOODS FOR KITCHENS

MFR'S DESCRIPTION: *Cosmopolitan* kitchen ventilating hood announced for easy installation without remodeling or special wiring.

USES: with free-standing ranges.

SPECS/FEATURES: said to eliminate need for cabinets above range as vent pipe is built into hood itself which extends to ceiling. Is equipped with two-speed twin blower, rated to deliver 372 cfm at .0" static, 340 cfm at .1" static and 231 cfm at the .35" static resistance generated by average installations. FHA minimum standard is 120 cfm at .1" static. Units feature removable filters, built-in control switches, automatic shut-off switch, concealed lights and back-draft damper. Available in 9 colors and 4 sizes, ranging from 30" to 48" wide. Unit described as self-contained, fully assembled and pre-wired.

AIA FILE NO. 35-C

MFR: STANTHONY CORP.

Circle 235 for further information



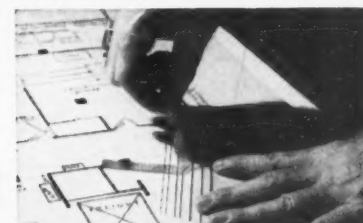
A GLUTTON FOR PUNISHMENT. The image, pencil or ink, on POST Polytex stays put. Won't rub, flake or peel off accidentally, yet can be erased. Duralar pencil lines bond to the surface readily. Soiled originals can be washed with water and detergent!

New POST-perfected Polytex takes pen or pencil perfectly

You already know that drafting films offer the advantages of tremendous durability and dimensional stability. Now, thanks to an exclusive, precision process, POST offers a drafting film with superlative drafting characteristics. The surface of Post 126 Polytex is unmatched for ink receptivity, has a coating that stands up, erasure after erasure. Ink lines won't pull off when cellophane tape is applied firmly over them and then suddenly yanked off. Transparency is excellent.

If you prefer pencil, use a Post Duralar lead for permanence. Plastic-based Duralar lines actually bond themselves to the Polytex surface. Drawings won't easily smudge or smear . . . can even be washed with soap and water.

By using new Polytex, with DuPont Mylar base, you avoid the drawbacks which show up in some



TAPE TEST proves remarkable adhesion of inked lines to the surface of POST 126 Drafting Film, lines which do not feather out or spread.

films . . . a drawing surface too slick to retain a pencil or pen line . . . too soft for use with hard pencil after erasures.

Enjoy the flexibility and long life of a drafting film with an ideal drafting surface. Try new 126 Polytex Drafting Film.

For more information, see your local Post Blueprinter, or write Frederick Post Company, 3654 N. Avondale Avenue, Chicago 18, Illinois.



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Circle 119 for further information

There's more to selecting water coolers than meets the eye...

LOOK BEYOND THE OBVIOUS

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You'll find General Electric water coolers are years-ahead in offering this **TOTAL VALUE**. General Electric coolers feature clean, modern lines, a stainless steel top, and a harmonious gray finish to fit into any décor. They're economical too! Thirteen models (hot-and-cold, pressure and bottle types) are moderately priced. Operating costs are negligible.

CHECK THE YELLOW PAGES for your General Electric distributor. He can deliver the units you need immediately. A written one-year warranty on all parts and five-year replacement agreement on the refrigeration system help you avoid major repair

costs. Also, nationwide General Electric service centers are always close at hand.

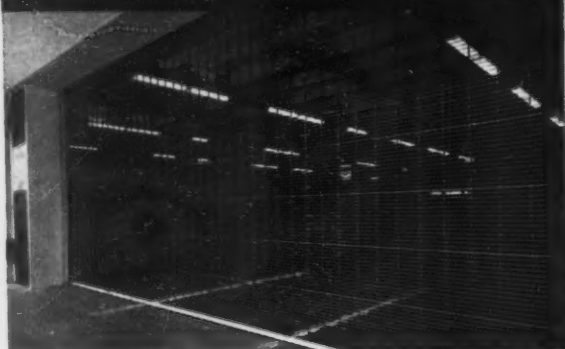
Add to this General Electric's long years of leadership with water coolers and you can see that only General Electric gives you **TOTAL VALUE** for the water coolers you buy. 761-4



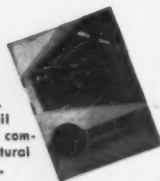
GENERAL  ELECTRIC

Circle 120 for further information

SURE PROTECTION OF VENTILATED OPENINGS WITH ROLLING GRILLES—BY **COOKSON**



FULL VISIBILITY AND ATTRACTIVENESS FOR ★ SCHOOL CORRIDORS ★ GARAGES ★ STORE FRONTS ★ COURTYARDS ★ OPEN AIR MARKETS ★ INDUSTRIAL PLANTS ★ STAIRWAYS



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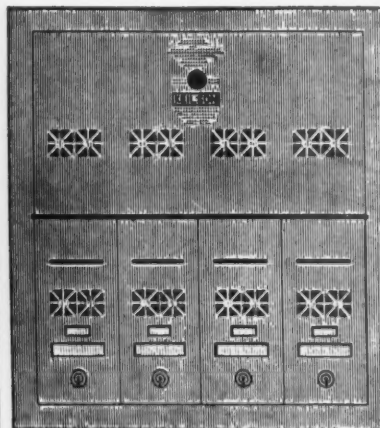
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Circle 121 for further information

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The strongest, most attractive letter boxes on the market—heavy welded construction—rugged upper door equipped for installation of government lock by Post Office—rust resistant interiors—mitred corners—3 to 12 unit sizes for double and single row mounting—2 unit boxes for 2 family homes—brass, steel, and stainless steel in a variety of finishes.



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180 N. Wacker Drive, Chicago, Ill.

Circle 122 for further information

PRODUCTS, EQUIPMENT, MATERIALS



SELF-CONTAINED FOOD CENTER

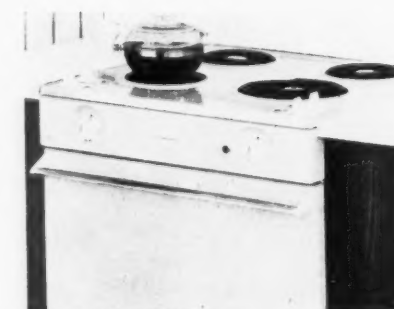
MFR'S DESCRIPTION: *Chef President II* unit is complete food and entertainment center, self-contained in attractive cabinet.

USES: applications in offices, recreation rooms, apartments and motels. SPECS/FEATURES: cabinets available in various wood grain finishes. Refrigerator is 4 cu ft, has seamless plastic innerliner and horizontal freezer, able to hold 9 ice cube trays. Electric cooking top is equipped with 110 volt or 220 volt, tilt-up surface units. Storage space is provided. Entire top of unit is stainless steel. Door, storage compartment and refrigerator lock separately. Dimensions are 48" long x 22 7/8" deep x 42" high.

AIA FILE NO. 35-C-11

MFR: GENERAL AIR CONDITIONING CORP.

Circle 236 for further information



BUILT-IN UNITS FOR KITCHENS

MFR'S DESCRIPTION: line of built-in appliances announced, comprising 2 under counter dishwasher-dryers, electronic oven, 10 gas and electric ovens and ranges and flexible, drop-in cooking unit.

USES: limited space kitchen applications.

SPECS/FEATURES: electric drop-in unit (shown) is stated to be both oven and range in single package which fits into 2 sq ft area. Is avail-

Architectural & Engineering News

able with thermostatic-control element, remote automatic clock controls and rectangular glass oven window. Other features, common to all cooking units, include: full width doors, insulated with fibrous glass, which open to 180°, and are easy to remove for ease of access; large oven; reversible oven racks which provide from 5 to 10 bake and broil positions; and porcelain lining.

AIA FILE NO. 35-C-1

MFR: WASTE KING CORP.

Circle 237 for further information

METAL UNITS

FINISH FOR STEEL CABINETS

MFR'S DESCRIPTION: *Traditional Finish* is designation of kitchen cabinet finish said to blend strength and permanence of steel with warmth and texture of wood.

USES: on steel kitchen cabinets.

SPECS/FEATURES: finish is vinyl plastic designed in natural mahogany wood grain, and bonded inseparably to steel cabinet doors and drawer fronts. Withstands abrasions and impact; will not chip, crack, peel, splinter or warp, according to mfr. Also described as resistant to chemicals, moisture, fire, heat and cold. May be cleaned with damp cloth.

AIA FILE NO. 15-E

MFR: REPUBLIC STEEL CORP.

Circle 238 for further information



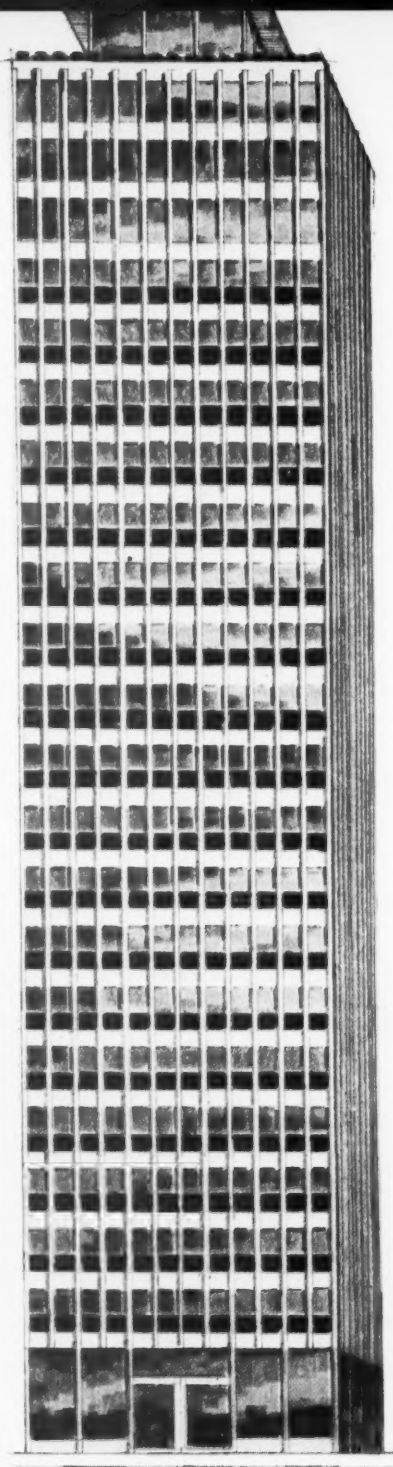
STOCK STEEL TAPERED GIRDER

MFR'S DESCRIPTION: tapered girder introduced said to be ideal for exposed construction of all kinds.

USES: roofs and floors of industrial, commercial and public buildings.

SPECS/FEATURES: consists of top and bottom flanges and web, which may be varied in size according to structural needs. By varying taper, inverting the beam, cantilevering and other combinations, many types of

Circle 123 for further information →



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GENERAL OFFICES: P. O. BOX 7188, STATION "C", ATLANTA, GA. • NEW YORK, N. Y. • CHICAGO, ILL. • DALLAS, TEXAS • PARAMUS, N. J.

CONCRETE IS NOT FOREVER



It pays an engineer to remind himself that concrete starts to break down the instant the forms are off . . . in major or minor degree depending on weather, corrosion or moisture pressure. When conditions are severe, no reminder is necessary, but somewhat more obscure is the need for high quality protective materials. Inferior coatings always cost more eventually. Since 1912, Standard Dry Wall, Inc. has been in no other business than the protection of masonry, and its products are leaders in the field. Thoroseal, for example, may be easily applied with our money-saving, long-handled brush, and will impart both a waterproof and decorative surface in gray, white or color. Write for our free specification folder on all Thoro System products.



Please send new 20-page specification guide describing all products and uses.

Name

Company

Address

Standard Dry Wall

Box X-15 New Eagle, Pa. Products, Inc.

Plants at New Eagle, Pennsylvania and Centerville, Indiana

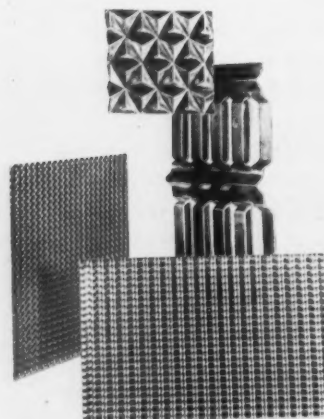
Circle 124 for further information

PRODUCTS, EQUIPMENT, MATERIALS

roof and floor systems are made practical, mfr states. Fabricated from stock steel plates, unit offers higher carrying capacity than rolled sections with same weight of steel, according to mfr. Available in lengths from 24' to 130'.

AIA FILE NO. 13-C

MFR: SHLAGRO STEEL PRODUCTS CORP.
Circle 239 for further information



ALUMINUM SHEETS IN COLOR

MFR'S DESCRIPTION: line of three-dimensional aluminum sheeting announced, called 3-D Sheet.

USES: spandrel panels, building facades, room dividers and solar shades are among suggested applications.

SPECS/FEATURES: line includes four patterns: *Offset*, large vented design; *Baguette*, flat-top, perforated design; *Regent*, round perforation; and *Egyptian*, featuring alternate raised and depressed pyramids. Each available in any of 11 *Alumalure* finishes, in single standard alloy, size and temper. Sheets are 4' x 8'.

AIA FILE NO. 15-J

MFR: ALUMINUM CO. OF AMERICA
Circle 240 for further information

HVAC

WATER CHILLER LINE EXPANDED

MFR'S DESCRIPTION: packaged water chillers of 100-ton and 125-ton capacities added to *HE Flow Therm* line.

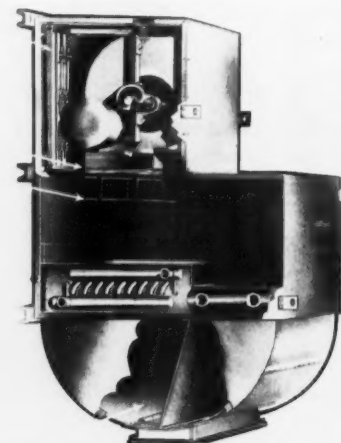
USES: medium and large commercial air conditioning installations or industrial process applications.

SPECS/FEATURES: line now includes 8 models, in capacities of 20, 25, 30, 40, 50, 60, 100 and 125 tons. Mfr claims size and weight of units reduced about 50 per cent, through use of matched components and engineering efficiencies. Features in-

clude: hermetic compressor; greater ratio of heat transfer capacity to shell size for coolers; and control box which can be locked to prevent tampering.

AIA FILE NO. 30-F-31

MFR: ACME INDUSTRIES, INC.
Circle 241 for further information



HIGH-VELOCITY AC EQUIPMENT

MFR'S DESCRIPTION: line of high-velocity air-conditioning equipment offered in range of nine models.

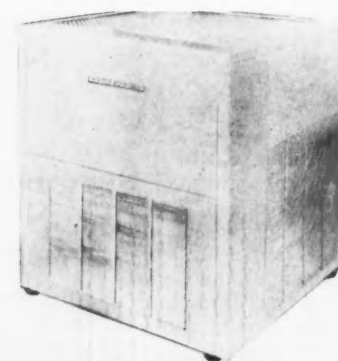
USES: multi-storied applications.

SPECS/FEATURES: line, engineered for hot and cold duct operation at static pressures from 2 1/2" to 8", redesigned to incorporate such features as plenum divider for ease of connecting ductwork on double-duct system. Other features include: horizontal or vertical discharge; spring-mounted fan and motor assembly for total internal vibration isolation; discharge plenum; and baffle dividing hot and cold sections.

AIA FILE NO. 30-F-2

MFR: DRAYER-HANSON DIV., NATIONAL U. S. RADIATOR CORP.

Circle 242 for further information



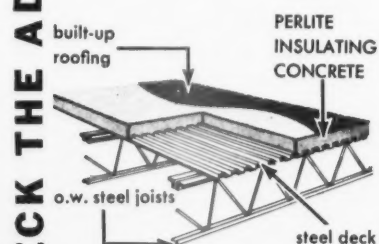
REMOTE AC UNITS FOR CUSTOM COOLING

MFR'S DESCRIPTION: remote air-con-

Architectural & Engineering News

PERLITE

INSULATING CONCRETE FOR ROOF DECKS



Here are only a few of the reasons why you should specify this modern, practical construction material on your next project.

Perlite Insulating Concrete

is lightweight, yet exceedingly strong where combined wide spans and high load carrying capacities are required.

Perlite Insulating Concrete

forms a fire safe permanent insulating roof deck that offers up to 20 times more Thermal insulation than ordinary concrete.

Perlite Insulating Concrete

bonds directly to galvanized metal and eliminates the necessity of a combustible bonding agent used under rigid insulation.

Perlite Insulating Concrete's

low dead load offers savings in structural steel. It may be job or transit mixed and poured monolithically on any kind of surface or pre-cast into panels or slabs.

... But these are only some of the many advantages offered by Perlite concrete aggregate... want to know more? Write today for A.I.A. file No. 37-B-2.

Perlite
INSTITUTE INC.

45 WEST 45TH ST., NEW YORK 36, N. Y.

Circle 125 for further information

May 1960

ditioning systems announced, built to fit any kind of existing furnace. USES: residential and small commercial cooling applications.

SPECS/FEATURES: units feature 4 different air-conditioning coil shapes said to offer custom design features with standard units. Air handler unit is available if existing furnace hasn't sufficient air moving capacity. Where separate cooling system might be desired, vertical-horizontal air handlers and coils can be used, mfr states. System intended to offer cooling for entire house with one simple system; mfr claims fewer components with greater capacity aid in obtaining greater reliability and more uniform temperatures.

AIA FILE NO. 30-F-1

MFR: PERFECTION DIV., HUPP CORP.

Circle 243 for further information

PLUMBING FIXTURES

BATHTUB WITH CENTER DRAIN

MFR'S DESCRIPTION: bathtub featuring drain opening at center edge introduced.

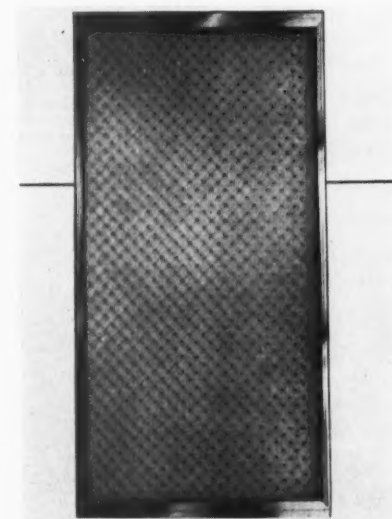
USES: residential bathrooms.

SPECS/FEATURES: position of drain enables use of standard tub regardless of which end fixtures are placed upon. Units have 5' recess; are made of acid resistant porcelain enameled formed steel. Designed for wall-hung installation, units have 1" leak-proof wall flange and full length grab rail. Available in seven colors.

AIA FILE NO. 29-H-3

MFR: ALLIANCEWARE, INC.

Circle 244 for further information



DECORATIVE SHEETS FOR SHOWER ENCLOSURES

MFR'S DESCRIPTION: line of shower enclosures announced, utilizing *Panelon*, decorative, shatter-resistant material.

USES: residences and motels.

SPECS/FEATURES: frames are of extruded aluminum, anodized in either silver or gold. Natural foilage and textiles are embedded in panels to give wide range of mural patterns. AIA FILE NO. 29-H-3

MFR: PANELMODE CORP.

Circle 245 for further information

REINFORCED PLASTIC BATHROOM FIXTURES

MFR'S DESCRIPTION: *Fibersheen* line of reinforced plastic bathroom fixtures announced.

USES: residential and institutional use.

SPECS/FEATURES: line consists of shower stalls and receptors, bathtubs and lavatory-vanities, of glass fiber reinforced polyester resin. Units are of one-piece, lightweight, seamless construction for rapid installation. Described as non-leaking and resistant to chipping, rusting and rotting; have hard, nonporous surfaces, easily cleaned with soap or detergent, according to mfr. Available in shades of white, gray, green, tan, pink and sun yellow, with gold flecks.

AIA FILE NO. 29-H-3

MFR: DENVER METALS & CHEMICALS CORP.

Circle 246 for further information

MISCELLANY



PREFABRICATED CANOPIES FOR OUTDOOR USE

MFR'S DESCRIPTION: large, outdoor canopy introduced as prefabricated shelter.

USES: service stations, drive-ins, pavilions, etc.

SPECS/FEATURES: developed by Tru-Scale Div., Wasco Chemical Co., structure is 20' tall, prefabricated shelter of glass-reinforced polyester. Reported to have important cost advantages over similar structures of conventional materials. Basically, is 30' x 30' modular unit of hollow, reinforced plastic beams supporting flexible sheeting of same material. Described as weather resistant, with lasting color.

AIA FILE NO. 17-A

MFR: MONSANTO CHEMICAL CO.

Circle 247 for further information

NEW CATALOG

ON PYREX® LIFETIME DRAINLINE


The only drainline guaranteed against corrosion and leakage



HERE'S WHAT IT TELLS YOU. All you need to know about PYREX lifetime drainline (the only kind *guaranteed* for the life of the building in which it is installed). All you need to know about the special glass we make it from that stands up to almost everything from heat to cold, acid to alkali, shock and impact. All you need to know about how high you can stack it, how far you can run it, how deep you can bury it.

It tells in text, tables and photos how to install it, how to make joints that lock with the turn of a single nut and how to hang it. All you need to know about fittings, sizes. Even prices are included. And there's a typical specification to guide you in including PYREX Lifetime Drainline in your next job.

USE THIS COUPON

		CORNING GLASS WORKS	
8 Crystal Street, Corning, New York			
CORNING MEANS RESEARCH IN GLASS			
Please send me a copy of the new 12-page catalog, PYREX Lifetime Drainline.			
Name		
Title		
Company		
Address		
City	Zone	State	

Circle 126 for further information

PRODUCTS, EQUIPMENT, MATERIALS

WOOD FINISH FOR INTERIORS

MFR'S DESCRIPTION: clear, fast-drying interior wood finish called *Rez 20*, developed.

USES: interior wood surfaces such as doors, paneling, cabinets, floors, etc. **SPECS/FEATURES:** described as providing durable, clear satin finish on surfaces. Alcohol and water resistant, material said to dry in 20 minutes; second coat can be applied after two hours, according to mfr.

AIA FILE NO. 25-B-17

MFR: REZ WOOD-TONES, INC.

Circle 248 for further information



GROUND DETECTOR FOR HOSPITALS

MFR'S DESCRIPTION: *Model 1515 Dynamic Ground Detector* offered to indicate dangerous electrical connections.

USES: hospital operating rooms.

SPECS/FEATURES: unit is designed to have sufficient sensitivity to be practical for operating rooms, where explosive atmospheres are encountered, to indicate dangerous electrical connections, i. e., leakage to ground which could cause explosive spark or electrical shock. Said to be equally sensitive to balanced or unbalanced grounds of any configuration of resistance or capacitive impedance likely to occur on ac two-wire supply.

AIA FILE NO. 35-K-6

MFR: MELTRONICS, INC.

Circle 249 for further information

PARKING FACILITY IS AUTOMATIC

MFR'S DESCRIPTION: development announced of automatic parking facility.

USES: parking installations on lots of limited size.

SPECS/FEATURES: device said to permit driver to deliver his car and lock it. Removing, parking and delivering vehicle are fully automatic; no one drives car but original driver. System is movable pallet system contained within structural steel frame-

Circle 127 for further information >



PRODUCTS, EQUIPMENT, MATERIALS

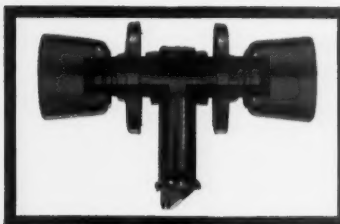
for really new construction **MAGNALOCK**

Not just another heavy-duty bored lock... but an entirely new concept from Sargent. Exclusive "T" Zone construction for greater strength and security. Self-supporting for standard hollow metal door cutouts. Reverses completely without disassembly. Styled in the same newest fashion designs of the IntegraLock line in a variety of knobs, escutcheons, finishes. Available also in standard duty SentryLock. Planning something really new? Call your Sargent supplier or write: **Sargent & Company, New Haven 9, Connecticut**

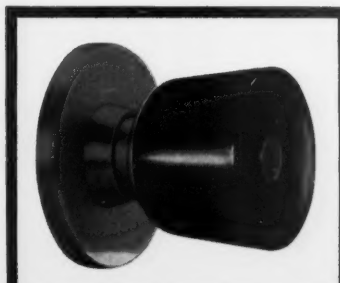


SARGENT

THE NEWEST FASHION IN A COMPLETE LINE OF ARCHITECTURAL HARDWARE



"T" Zone (torque zone) Toughness. One-piece aligning tube and latch tube interlock, form rugged bend-proof, torque-resistant "T" in critical twist area.



NOW AVAILABLE IN MAGNALOCK LINE—new non-static, Delrin® knobs in black, off-white and mahogany. Complements metal finish or colorful fired-copper roses.
©Du Pont

work; reported to be electrically interlocked, entirely mechanical and able to move cars of all sizes in both horizontal and vertical directions. Operating unit is 10½' wide facilitating installation of several on small lot. May be built as many levels high as desired, according to mfr, who states car can be delivered in 35 seconds.

AIA FILE NO. 38-L-1

MFR: TAYLOR & GASKIN, INC.

Circle 250 for further information

GLASS-PROTECTED SMOKESTACKS

MFR'S DESCRIPTION: announcement made of steel smokestack, lined inside and out with colored, acid-resistant glass.

USES: industrial and commercial installations.

SPECS/FEATURES: said to increase life of ordinary unlined steel unit in similar service by three to five times. Process permanently fuses brightly hued color dyes into unit's glassed exterior. Mfr states extreme temperature and weather conditions have little or no dulling effect on glass.

AIA FILE NO. 14-H

MFR: A. O. SMITH CORP.

Circle 251 for further information



FIRE DETECTION THERMOSTAT

MFR'S DESCRIPTION: *N-Co-Stat*, fixed temperature, resetting thermostat available.

USES: fire detection in relatively small areas.

SPECS/FEATURES: recommended for areas subject to rapid temperature fluctuations, such as boiler rooms, kitchens, drying rooms and bathrooms. Designed with open back to provide easy access to terminals. Features include attractive, inconspicuous appearance, semi-flush mounting, waterproof and airtight element and installation ease.

AIA FILE NO. 29-E

MFR: NOTIFIER CORP.

Circle 252 for further information

← Circle 127 for further information

Competitively priced **PARAGON** projected aluminum **WINDOWS**



Swing 2 BIG
BENEFITS
YOUR WAY

DESIGN: Aluminum beauty . . . clean functional lines that are adaptable to any styling plus the rugged strength of heliarc welded construction. Inside bead glazing . . . white bronze hardware standard.

FUNCTION: Ideal ease of operation and practical draft control settings . . . easily positioned on nylon shoes under spring tension . . . weather tight closure with single plane polyvinyl seal.

PLUS THIS BIG BONUS: Paragon windows are competitively priced. A heavyweight sturdy window in the medium price range, Paragon offers many fine construction features usually found only in costlier windows at prices lower than those charged for some makes of lesser quality.

Feel sure that you're giving your client the best. Specify Paragon! Here is a projected aluminum window ideal for hospitals, schools, offices, public buildings and commercial installations of all kinds. You can have Paragon Windows in special sizes and arrangements for single or multi-story curtain walls. Bids will be submitted for prompt delivery on either large or small orders. Engineering consultation is available to architects with no obligation. For information write:

PETERSON WINDOW CORPORATION
706 Livernois Avenue, Ferndale 20, Michigan

Circle 128 for further information

LITERATURE

Literature cited in this department is available from various manufacturers and associations free of charge, except where indicated. To obtain copies, circle the keyed numbers on the reader service cards facing pages 1 and 58.



300

CONCRETE STAIR UNITS

Timely brochure discusses efficiency unit for forming and reinforcing concrete stairs, either precast or cast-in-place. Units, custom built to architect's specifications, consist of prefabricated metal form, metal riser fronts, reinforcing and temperature rods, plate, channel or exposed stringers, all welded into rigid one-piece unit. Photographs, detail drawings and tables present structural information and construction details. Design rules and specifications also given. Mfr claims flexible design, accurate dimensioning, lower cost, rigid welded reinforcing, minimum forming and speed of erection as advantages. (8 pp.)

AIA FILE NO. 14-D

MFR: STAIRBUILDERS DIV., AMERICAN STAIR CORP.

Circle 300



301

WATER HEATER CATALOG

Line of gas and electric water heaters and hydro-pneumatic pump tanks presented in indexed catalog. Descriptive information shows capacities, sizes and styles, both galvanized and glasslined, with warranties from one to ten years. Heaters, for commercial, industrial and residential requirements, available in capacities from 6 to 120 gals. Pump tanks have capacities from 12 to 525 gals. Catalog is illustrated. (46 pp.)

AIA FILE NO. 29-D-2

MFR: W. L. JACKSON MFG. CO., INC.

Circle 301

CONTRACTS BROCHURE

Economy and Efficiency with Separate Mechanical Contracts, is current brochure which covers subjects of construction costs and quality of performance. Purpose is to acquaint architects, engineers, contractors, owners, etc. with facts favoring sepa-

rate mechanical contract system which, reportedly, permits architect to exercise more direct control in selection and supervision of mechanical contractor involved on project. Brochure lists legal facts, explains system and discusses advantages to owners, architects, engineers and contractors, in addition to general advantage of decreasing construction costs. (20 pp.)

AIA FILE NO. 40

ASSN: NATIONAL ASSN. OF PLUMBING CONTRACTORS

Circle 302

PANEL SPECIFICATIONS

Specification for Architectural Porcelain Enamel on Steel for Exterior Use, is recent tentative standard, based on experiences and recommendations of industrial personnel. Detailed requirements are given for base metal, processing requirements, porcelain enamel finish, panel flatness and clips and attachments. Methods for testing weather resistance of finish are described. Supplementary considerations, such as gloss, texture, thickness of metal, packaging, shipping and shop drawings, are offered as aid to specification writers.

AIA FILE NO. 15-M-1

ASSN: PORCELAIN ENAMEL INSTITUTE, INC.

Circle 303

TUBULAR PRICES

Price books offered, covering standard pipe, line pipe and oil country tubular goods. Designed for fast, easy reading and quick reference, books have large type faces and 8½" x 11" pages which lie flat on desk surface. Pricing information is arranged in table form; sizes and 100' prices are listed in bold face type. Tubular prices are covered in four separate sections, one each for standard pipe; line pipe; standard pipe and line pipe extras and allowances; and oil country tubular goods prices and extras and allowances. Indices are provided; replacement service offered to keep books current.

AIA FILE NO. 29-B

MFR: THE YOUNGSTOWN SHEET AND TUBE CO.

Circle 304

ALLOY SELECTION

Booklet offered, intended to serve as guide to selection of aluminum alloys. Text describes physical properties, fabrication characteristics and economic advantages of variety of aluminum sheet, plate, rod, bar, extrusion and casting alloys. Various tempers, finishes and patterns available are discussed, in addition to such subjects as specialty sheet products, bus conductor, mine and oil country pipe, architectural shapes and effi-



THE STORY BEHIND THIS SEAL

This is more than just the Seal of Approval of the Steel Joist Institute. It is the symbol of a 32-year-old dedication to the welfare and progress of an important segment of the design and construction industries.

What is the Steel Joist Institute?

It is a voluntary association, organized in 1928, of open web steel joist manufacturers. Membership is available to any producer of open web steel joists who elects to manufacture joists in accordance with the standards and practices as adopted by the Institute.

What is its purpose?

The Steel Joist Institute is a nonprofit organization made up of manufacturers actively engaged in the fabrication and distribution of open web steel joists. It was organized to place the industry on a sound engineering basis. Its objectives are to establish methods of design and construction for open web steel joists, to provide test and research data for public dissemination, to assist in the development of appropriate building code regulations, and to publish information relative to the proper

use of steel joists in the interest of safety and the public welfare.

What are its accomplishments?

The Institute has made substantial practical contributions to the building construction industry. It has developed and published a comprehensive manual of standard specifications, load tables, and technical bulletins to assist the architect, engineer, and contractor; conducted research and testing of open web steel joists, bridging and cantilever members; initiated a thorough, effective quality verification program for "S" Series joists and a recommended Code of Standard Practice applicable to steel joists used for spans up to 96'.

Inquiries concerning the Steel Joist Institute should be sent to the Managing Director, Steel Joist Institute.

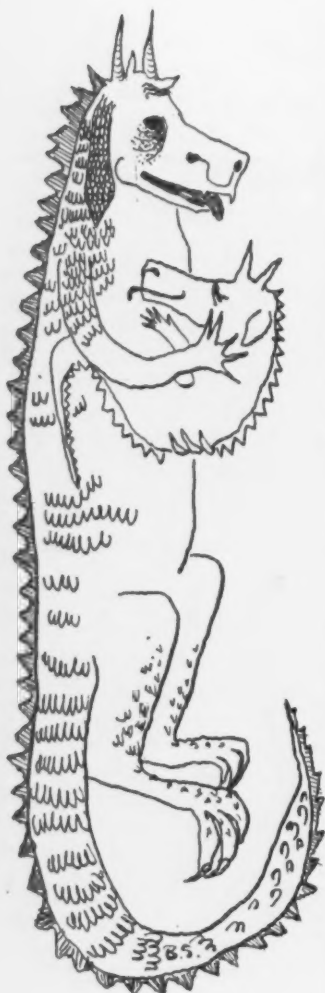
STEEL JOIST INSTITUTE

Suite 715 • 1346 Connecticut Avenue, N.W. • Washington 6, D. C.

Circle 129 for further information

Balfour
rolling doors

deserve your attention



rolling steel service doors
dec-port® rolling steel pier doors
automatic rolling fire doors
pygmy® rolling counter doors
rolling steel grilles

Details in Sweet's or write for catalog.

Walter Balfour & Co. Inc.
Brooklyn 22, N. Y.

Circle 130 for further information

cient storage of rod and bar. Aluminum's yield and tensile strength, thermal conductivity and electrical conductivity are graphically compared with those of other materials. (24 pp.)

AIA FILE NO. 15-J

MFR: OLIN MATHIESON CHEMICAL CORP.

Circle 305

PARKING LOT MANUAL

Current edition of manual, *How to Lay Out a Parking Lot*, offered as aid to planning parking areas in manner to permit handling maximum number of cars with greatest efficiency. Suggested layouts presented for 45°, 60° and 90° angle parking with recommended stall widths, lengths, aisle widths and entrance and exit dimensions; dimensions included for all makes of cars. Manual is illustrated with engineering drawings, photographs and charts of various types of parking lots. Descriptions are included for types of parking equipment, including automatic gates, parking barriers, guides and sonic detectors. (40 pp.)

AIA FILE NOS. 14-A-3; 38-M

MFR: ELECTRONIC PARKING GATE DIV., WESTERN INDUSTRIES, INC.

Circle 306

TERNE ROOFING

Recent bulletin gives detailed specifications for use of seamless terne roofing. In recently developed 50' seamless rolls, material is said to be easily and economically applied; typical installed costs range from \$.50 to \$.75 psf. Publication pictures several recent structures with various styles of terne roofs and gives complete specifications for standard methods of application.

AIA FILE NO. 12-A-31

ASSN: LEAD INDUSTRIES ASSN.

Circle 307

CONCRETE/CEMENT

COLORED CONCRETE

Descriptions, uses, methods of application and colors presented in recent catalog, for *Colorundum*, hard, abrasion-resistant, decorative, integrally colored concrete material. Detailed specifications for application by topping or monolithic method included. (4 pp.)

AIA FILE NOS. 3-B-1; 3-K; 11-L

MFR: A. C. HORN COS., SUBS., SUN CHEMICAL CORP.

Circle 308

WATERTIGHT CONCRETE

Factual summary of authoritative information on design and specification of watertight concrete is given in topical publication. Discussion covers basic requirements for watertight concrete and how *Pozzoloth* reduces shrinkage, bleeding and segregation

to produce strong, durable structural concrete, highly resistant to penetration of water under normal conditions. (6 pp.)

AIA FILE NO. 4-B

MFR: THE MASTER BUILDERS CO., DIV.,

AIA FILE NO. 29-D-2

Circle 309

WHITE MASONRY CEMENT

Recent brochure treats *Stoneset* white masonry cement, intended for use in setting of stone and brick facing and setting of all types of brick, building tile, concrete and glass blocks. Features, specifications, mixing instructions and requirements are given. Photographs note recent applications of material, described as non-staining and economical. (8 pp.)

AIA FILE NO. 3-A-9

MFR: MEDUSA PORTLAND CEMENT CO.

Circle 310

STADIUM CONSTRUCTION

Current brochure presents case histories of concreting problems encountered and successfully solved in stadium and auditorium construction. Reports of 16 projects here and abroad cite role of *Pozzoloth* in obtaining desired handling properties of concrete during placement and meeting exacting requirements for concrete in hardened state. Photographs included. (20 pp.)

AIA FILE NO. 4-B

MFR: THE MASTER BUILDERS CO., DIV., AMERICAN-MARIETTA CO.

Circle 311

EPOXY APPLICATIONS

Handbook of Application Methods offered, detailing field tested application methods for bonding concrete. Includes surface preparation, equipment required, mixing procedures, curing and use of solvents in adhesives. Contains pertinent information for use in repair of highways, buildings, bridges, airport runways, sidewalks, etc. Tables also presented on effect of temperature on curing time. (32 pp.)

AIA FILE NO. 4-N

MFR: INTERNATIONAL EPOXY CORP.

Circle 312

EFFLORESCENCE/CHALKING

Causes of efflorescence and early chalking on painted masonry surfaces, and effective methods for overcoming and preventing this deterioration are authoritatively discussed in recent publication. Based on technical paper given 1959 Roon Foundation Award, booklet is intended to serve as reference aid for architects, specification writers and others. Extensive treatment is given to efflorescence; other subjects include: film swelling; film coalescence; paint stability in presence of soluble salts; pigmentation; pigment volume con-

LITERATURE

centration; pigment dispersion and flocculation; and effects of titanium dioxide and extenders on chalking. (48 pp.)

AIA FILE NO. 5-M

MFR: ROHM & HAAS CO.

Circle 313

CONCRETE PATCHING

Thoropatch, crack-resistant patching material for concrete, brick and masonry, said to finish to natural cement color, described in recent folder. Photographs show application methods. Test results for tensile strength, compressive strength, density and flexural strength and resistance to acids and other corrosives included. (4 pp.)

AIA FILE NO. 3-B-1

MFR: STANDARD DRY WALL PRODUCTS, INC.

Circle 314

LIGHTING

LIGHTING FIXTURES

Three recent brochures describe line of lighting fixtures for varied locations. Entitled, *Exit and Aisle Lights*, publication treats UL approved units of fluorescent or incandescent type with unbreakable lens panel of fibrous glass. *Opal Luminaires* describes pendant and spin-up fixtures with hand blown opal globes for exterior use. *Opal Drum Lights* treats opal units for installation on ceilings and walls; relamping ease said to be a feature. (each 4 pp.)

AIA FILE NO. 31-F-2

MFR: PRESCOLITE MFG. CORP.

Circle 315

VINYL LOUVERS

Catalog offered, describing *Circlights*, rigid, non-burning vinyl louvers for lighting applications. Units are offered in 12 standard styles to meet overhead lighting requirements. Contained are complete mechanical and engineering data with comparisons of illuminating efficiencies with other diffusers. Also included are specifications and descriptions of UL tests for light stability, brightness control, acoustical properties, air circulation and non-drop out design. (6 pp.)

AIA FILE NO. 31-F-2

MFR: CIRVAC PLASTICS

Circle 316

LIGHTING SPECIFICATIONS

Standard Specifications for Industrial Lighting, 1960 edition, available to architects, consulting, illuminating and plant engineers, and others. Three specifications have been added for 1500ma units; D-4 fluorescent semi-direct medium high mounting, SD-3AL semi-direct aluminum and

SD-3PE semi-direct porcelain enamel units. Book contains upward revisions of existing specifications, including high specifications for materials; for aluminum reflectors; and added provisions for inspection and testing. Specifications now include, where applicable: (1) grounding of all component parts; (2) continuity of grounding throughout a continuous row; (3) silver plated contacts in "rapid start" units; and (4) synthetic enamel specifications for component parts, covering rust inhibiting undercoating, adhesion and hardness. (52 pp.)

AIA FILE NO. 31-F

ASSN: THE RLM STANDARDS INSTITUTE, INC.

Circle 317

INCANDESCENT FIXTURES

Recessed Incandescent Lighting is catalog incorporating *Calculite* group of recessed incandescent fixtures; offered as guide to proper fixture selection. Details given for concentrated, medium and wide spread beams; round and square units for use with general service and PAR lamps, 30 to 300 watts. ETL reports, construction drawings and lighting calculator charts provide information on 96 interchangeable housings and diffusers. (36 pp.)

AIA FILE NO. 31-F-23

MFR: LIGHTOLIER

Circle 318

SIDING/SHEATHING

INSULATING SHEATHING

Use of insulating fiberboard sheathing to economically provide year long comfort is described in current literature. Brochure discusses such advantages of material as bracing strength, high insulation value and durability. Results of racking strength tests, conducted under FHA specifications, also listed. Application instructions included for varied exterior surfaces. Chart compares economy and insulating efficiency of three types of insulating fiberboard sheathing, with horizontal wood sheathing, gypsum sheathing and plywood sheathing. (12 pp.)

AIA FILE NO. 19-D-3

MFR: THE CELOTEX CORP.

Circle 319

GROOVED BOARD PANELS

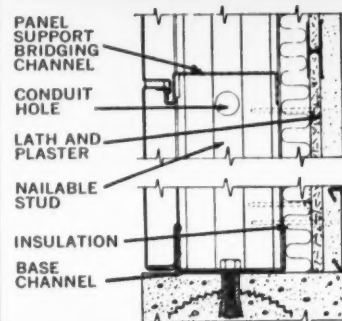
Par-Tex 3-D, vertically grooved particleboard which can be painted, is subject of current bulletin. Included in bulletin is information on features and applications of material, advantages and photographs of installations. Applications include: for exteriors—siding, sheathing, gable ends, fences, carports, and breezeways; for interiors—wall units and room dividers. Panels are 4' x 8', ver-

IT'S REVOLUTIONARY! IT'S LOAD-BEARING! IT'S ONE-POINT RESPONSIBILITY!

Here's a complete modular wall system which integrates lightweight nailable steel framing with architectural porcelain panels and aluminum extrusions. The steel framework is load-bearing and specially designed to hold the thermally efficient panels without additional framing or attachment operations. This skeleton-and-skin coordination not only saves during construction, it provides unlimited design possibilities. ■ Foundations or footings need not be heavy or complex. The structural load-bearing framework of Stran-Steel has a high strength/weight ratio. Architectural panels and other collateral materials attach without secondary

members. Panels are hung from the integral "J" girts and simply snap in place without exposed fastenings—without welding, riveting or mispositioning. Windows, available in a variety of designs, slip in place quickly. And the integrated fit of joists and beams eliminates the need for dropped ceilings or boxed beams. ■ The complete Stran-Wall system—including panels, insulation, nailable steel framing, and aluminum mullions for doors and windows—is available from one source, your Stran-Steel architectural products dealer. For specifications and details, mail the coupon or call him. He's listed in the Yellow Pages under Steel.

NEW STRAN-WALL SYSTEM



ARCHITECTURAL PORCELAIN PANELS: FLAT, COLORFUL, MAINTENANCE-FREE—Extremely flat panel surfaces reduce reflection patterns. Porcelainized both sides, Stran-Wall panels come in 72 colors, 3 textures (smooth, ripple, stipple), 3 finishes (gloss, semi-gloss, matte).

WALL CROSS SECTION



Stran-Steel Corporation, Dept. AEN-11, Detroit 29, Michigan

Please send complete information on the new Stran-Wall System.

Name _____ Title _____

Company _____

Phone _____

Address _____

City _____ Zone _____ State _____

STRAN-STEEL IS A DIVISION OF NATIONAL STEEL CORPORATION

Circle 131 for further information



Bally walk-ins

Aluminum or steel sectional construction

Sanitary! Strong! Efficient! You can assemble any size cooler, freezer or combination in any shape from standard sections. Add sections to increase size as your requirements grow. Easy to disassemble for relocation.

Bally Case and Cooler, Inc., Bally, Pa.

Get details — write AN-5 for FREE book.
Circle 132 for further information

yours **FREE...** the **NEW**
1960 RLM specifications book for
**industrial
lighting
equipment** brings you
New and Upward Revised Standards

BUT...

REMEMBER THIS IMPORTANT FACT!
This new edition announcement again emphasizes the fact that RLM Specifications are not fixed standards! They are Quality Standards that grow with the Industry and the Science of Illumination. For your new, complimentary copy of the 1960 RLM Specifications Book, write RLM STANDARDS INSTITUTE, 326 W. Madison St., Dept. 8375 Chicago 6, Illinois.



**THE FINAL INGREDIENT
OF BEING SURE**

Circle 133 for further information

LITERATURE

tically grooved. Tables present data on physical properties, underlayment requirements, nailing patterns and allied technical data. (8 pp.)

AIA FILE NOS. 19-A-3; 19-D

MFR: PACQUA DIV., PACIFIC PLYWOOD CO.

Circle 320

WALL PANELS

File folder available containing three booklets and sheet of available colors, for line of insulated walls, metal panels, corrugated sheets and insulated sandwich sections for curtain walls and roofs. Units, for both interiors and exteriors, are formed in aluminum, galvanized steel, aluminized steel, stainless steel and other mill finishes and architectural colors. Photographs, section drawings and tables of allowable spans are included.

AIA FILE NO. 17

MFR: ELWIN G. SMITH & CO., INC.

Circle 321

PLYWOOD SHEATHING

Laboratory Bulletin 60-A details methods and results of series of tests to show that $\frac{3}{4}$ " roof sheathing is fully adequate in specific applications when panels are laid with face grain parallel to framing members. Allowable spans for plywood are normally based on applications where panels are applied with face grain perpendicular to framing members. Mfr states tested method is economical for certain types of stress skin panels. (10 pp.)

AIA FILE NO. 19-D-3

ASSN: TECHNICAL DEPT., DOUGLAS FIR PLYWOOD ASSN.

Circle 322

WALL PANELS

Booklet describing applications, characteristics and installation of Micarta surfaced panel wall materials, now available. Purpose is to provide architects and designers with working knowledge of uses and properties of panel wall materials, 16" x 96" panels on which decorative, high-pressure plastic laminate is bonded to fire-resistant compressed cellulose core. Photographs show procedures for installation; range of 11 patterns and colors is indicated with color swatches. (8 pp.)

AIA FILE NO. 23-L

MFR: MICARTA DIV., WESTINGHOUSE ELECTRIC CORP.

Circle 323

INSULATION

BUILDING INSULATION

Fundamentals of Building Insulation offered as aid to architects, engineers, students and builders. Book discusses reasons for using building insulation,



Maximum guard rail safety...

Minimum construction cost

with **SPEED-RAIL
SLIP-ON FITTINGS**

- no clamps, no washers,
- no nuts to assemble

It's been proved many times that safety guard rails and balustrades built with Speed-Rail structural pipe fittings will save construction time and money. These unique fittings are simply slipped onto standard I.P.S. pipe and the set screws tightened with a hex wrench. Costly threading and welding are eliminated, pipe-cutting is reduced to a minimum.

SPEED-RAIL Fittings, and the heavier-duty NU-RAIL Fittings, are the original slip-on structural pipe fittings. They are also the simplest and strongest fittings for building pipe structures.

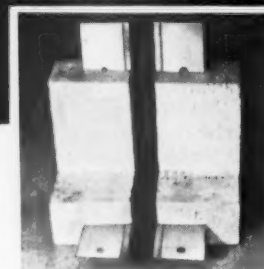
Be sure you have full information on the only truly complete line of structural pipe fittings—SPEED-RAIL and NU-RAIL Fittings. Leading distributors stock them; get all the facts now—write Dept. 33-AE.

THE HOLLANDER MANUFACTURING CO., 3841 Spring Grove Ave., Cincinnati 23, Ohio



Circle 134 for further information

Solve Your **EXPANSION JOINT**
Problems with *Expand-o-flash*

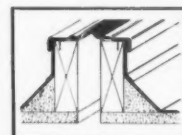


a neoprene
and copper
waterstop

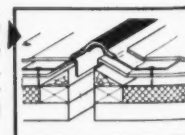
A through wall joint
and wall to floor joint
that really works.

Expand-o-flash provides a continuous watertight flexible seal all around a building, both above and below grade. Weatherproof flexible neoprene is bonded mechanically and adhesively to metal edging and is installed with totally relaxed neoprene bellows to allow both sides of the joint to move freely in any direction. Stresses and metal fatigue are eliminated.

- Shop fabricated corners and crossovers eliminate errors in the field and reduce the cost
- No training needed for installation
- Literature, engineering data and sample on request
- See us in Sweet's.



This curb roof expansion joint and low profile roof expansion joint are only two of many Expand-o-flash applications for roof movement in all three directions.



LAMONT & RILEY CO.

300 SOUTHWEST CUTOFF, WORCESTER 7, MASS.

Circle 135 for further information

Architectural & Engineering News

locations for efficient applications and how insulating material performs. Literature was award winner in Producers' Council 1960 Building Products Literature Competition at AIA Convention in San Francisco, for "outstanding efforts in the production of informative, high-quality product literature directed to the architect." (44 pp.)

AIA FILE NO. 37-D

ASSN: INSULATION BOARD INSTITUTE
Circle 324

INDUSTRIAL INSULATION

Recent catalog contains descriptions of line of over 30 industrial insulations. Properties and specifications of heat and cold insulations for service from sub-zero to 1900° F are presented. Spun mineral wool, calcium silicate, and 85 per cent magnesia products in block, blanket, felt, fill, cement and pipe insulation forms are among products described. Thermal conductivities and tables of recommended thicknesses are given for each product for appropriate temperature ranges. Illustrated application instructions also included. Selection chart indicates temperature range of all types of material; is presented with illustrations of typical installations in chemical, power, commercial and other fields. In addition, insulation specification guide identifies products with appropriate Federal, ASTM, U. S. Maritime Commission, Military Specifications and U. S. Dept. of Commercial Standards. (24 pp.)

AIA FILE NO. 37

MFR: INDUSTRIAL INSULATION DIV.,
BALDWIN-EHRET-HILL, INC.

Circle 325

MASONRY INSULATION

Advantages and typical applications of water-repellent masonry fill insulation for brick cavity and concrete block walls, presented in two available booklets. Publications contain text and charts on thermal efficiency, estimated fuel and air-conditioning savings, coverage tables and ease of installation. Product is free-flowing, granular material which is said to literally shed water without loss of insulation efficiency. Residences, schools, churches, motels and commercial and industrial buildings are among suggested applications.

AIA FILE NO. 37-D-3

MFR: ZONOLITE CO.

Circle 326

HVAC

AIR DIFFUSION

Current catalog offered, containing information on line of air diffusion equipment. Presented data includes application and specification information on line of return and supply reg-



HOW THE BOND WORKS:

- 1** Carey-approved roofers apply original roof consisting of one ply of Carey Feltex, two of Carey Fiberock with hot asphalt sealing. This is bonded for 10 years. Either new or old construction.
- 2** 6-8 years later Carey-approved roofers inspect, patch if necessary and recoat the roof. The bond is extended to 15 years from original installation.
- 3** 5 years later Carey-approved roofers perform a second preventive maintenance operation, patching as required and coating. The bond is extended to a full 20 years, dating from original installation.

THE ADVANTAGES:

There are numerous benefits with this new plan. Initial costs are lower. Payments are spread over several years because you pay as you maintain. Total cost is equal to an ordinary 20-year bond, but you get several years of bonus service after 20 years because your roof has been "renewed" twice during the bonded period.

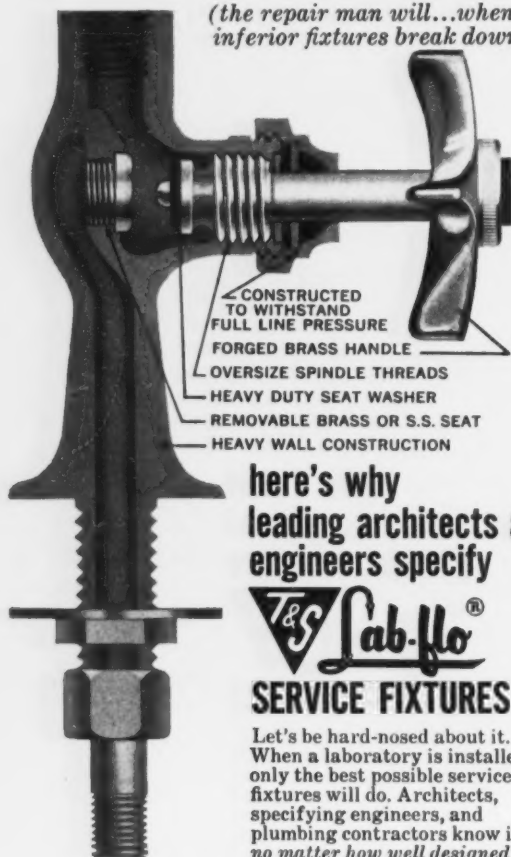
The first major development in roofing in 40 years, the new Carey "Maintenance-Type" Bond can be an important factor in your planning. This new bond applies to all smooth-surface built-up roofs up to 6-inch slope. Write Dept. AE-560 for full details or call your nearest Carey representative.

THE PHILIP CAREY MFG. COMPANY
Cincinnati 15, Ohio

Circle 136 for further information

LOOK "UNDER THE HOOD" of LABORATORY SERVICE FIXTURES

(the repair man will...when inferior fixtures break down.)



here's why
leading architects and
engineers specify

T&S Lab-Flo®
SERVICE FIXTURES

Let's be hard-nosed about it. When a laboratory is installed, only the best possible service fixtures will do. Architects, specifying engineers, and plumbing contractors know it no matter how well designed the science equipment is, it will operate only as well as its fixtures.

It's a fact that there are important differences in fixtures used for laboratory furniture and it takes such experts to recognize them—even the busy repair man on his frequent trips to replace ordinary washers, re-grind worn seats, or to install whole new units because of stripped threads. That is why T&S Lab-Flo Service Fixtures, heavy duty engineered and constructed throughout especially for laboratory use, are preferred for wood or metal installations of any size or design. Lab-Flo is built for strength, safety, and ease of handling in the laboratory. No thin walls or shallow threads to break down, no weak parts to give out when full line pressure is applied. Look at a cross-section of a Lab-Flo fixture and you will see a cross-section of quality at its finest. You pay for quality—why not get it? You will...when you specify Lab-Flo right down the line on your next laboratory installation, new or remodeled.

THOSE IN THE KNOW SPECIFY

Lab-Flo

See your **Lab-Flo** dealer or write for Catalog

SERVICE FIXTURES • HOSE COCKS
REMOTE CONTROLS • RECEPTACLES

Refer to 1960 Sweet's Catalog, Code: 27b
1a



T & S BRASS AND BRONZE WORKS, INC.
128 MAGNOLIA AVE., WESTBURY, L.I., N.Y.
Telephone: EDgewood 4-5104



Circle 137 for further information

LITERATURE

isters, extruded aluminum grilles, volume control dampers and door ventilators. Catalog received Producers' Council Certificate of Merit in 1960 Building Products Literature Competition at recent AIA Convention in San Francisco. (58 pp.)

AIA FILE NO. 30-J

MFR: WATERLOO REGISTER CO., INC.

Circle 327

PACKAGED AC UNITS

Illustrated bulletin describes line of packaged multi-zone air conditioners. Single-zone basic unit and multi-zone design are described. Line drawings illustrate available arrangements and location of elements. Basic specifications and dimensions also tabulated. (4 pp.)

AIA FILE NO. 30-F-2

MFR: INDUSTRIAL DIV., AMERICAN STANDARD

Circle 328

GAS BURNER

Recent bulletin explains mechanics, operation and installation of power gas conversion burner. Text and illustrations describe electric ignition system and wide input range (75,000 to 250,000 btuh) with all gases. Specifications and ratings included. (4 pp.)

AIA FILE NO. 30-G-4

MFR: LENNOX INDUSTRIES, INC.

Circle 329

INDUSTRIAL WATER HEATERS

Hot Water for Industrial Plants, is manual available to architects, designers and installers of hot water heater installations for industrial applications. Manual provides detailed information of hot water applications for industrial processes, laboratories, cafeterias and dining rooms, lavatories, showers, etc. Sizing charts, specifications, diagrams, installation data and comparative fuel cost chart for commercial water heating are included. Water heater installation section presents worthwhile information on booster systems, recovery systems, one temperature hot water, two temperature water, instantaneous systems and vertical tank installations. (100 pp.)

AIA FILE NO. 29-D-2

MFR: PERMAGLAS DIV., A. O. SMITH CORP.

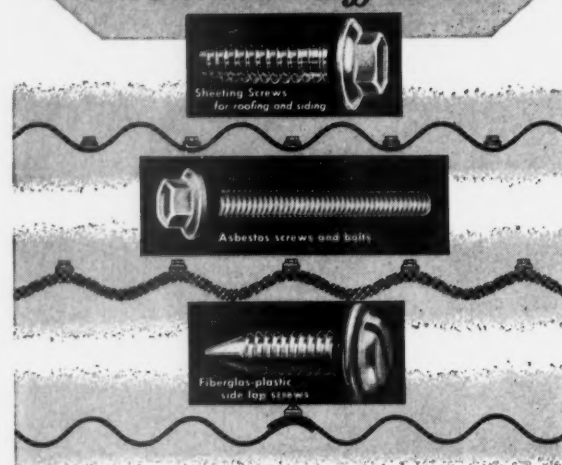
Circle 330

TECHNICAL LITERATURE

Literature Pertaining to the Art and Science of Oil Burning for Residential Applications, is review for researchers and designers which includes approximately 300 abstracts of technical literature available in field of residential oil burning. Pre-

Complete construction fastening systems

Townsend Tuff Tites®



A Townsend Tuff Tite fastener specifically designed to do the job is available for any sheeting or curtain wall application. These include structural and side lap screws for crown or valley fastening of all types of material—bolt and clip systems for asbestos and pilot point Tuff Tites for plastic win-

dows and skylights.

Economical, waterproof joints with high vibration resistance are assured when you use Townsend Tuff Tites.

Write for Bulletin TL-149a, Townsend Company, Engineered Fasteners Division, P. O. Box 71-V, Ellwood City, Pa.

Circle 138 for further information

OCTOBER - OCTOBER - OCTOBER

A&E NEWS CURTAIN WALL ISSUE

In 1959 the building industry applauded the A&E NEWS Curtain Wall Issue.

For increased sales in 1960, plan now on selling your curtain wall products, components and systems to America's architects and consulting engineers in the October 1960 Curtain Wall Issue.

Closing date for reservations, September 15, 1960.

pared by combustion technologists at Battelle Memorial Institute, publication is designed to provide a guide to technical literature, relating particularly to distillate fuel-oil combustion for residential heating equipment and similar low capacity oilfired applications. Sixteen subject classifications range from fundamental aspects, including the physics and chemistry of fuel-oil combustion, to latest equipment developments in art of oil burning. Emphasis placed upon more recent literature and upon earlier reviews or bibliographies within given subject area. (110 pp.) AIA FILE NO. 30-G

ASSN: DIV. OF MARKETING, AMERICAN PETROLEUM INSTITUTE
Circle 331

PARTITIONS

WOOD PARTITIONS

Bulletin No. 6003 describes wood side-coiling partitions, designed to provide durable, compact and attractive separation of large areas such as gymnasiums, classrooms, cafeterias and multipurpose rooms. Bulletin covers special features, design details and specifications. Partitions are constructed for openings up to 24' high, up to 125' wide for single and 250' wide for double openings. (4 pp.)

AIA FILE NO. 35-H-6
MFR: THE COOKSON CO.
Circle 332

PARTITION SYSTEM

Illustrated catalog issued, describing panel-board partition system. Partitions incorporate single modular framing system to which plywood hardwood or wallboard panels are attached by means of batten strips that snap into grooves in studs, thus enabling dismantling and re-erecting of partition in different location without loss of any parts. Catalog includes descriptions and illustrations of available partition types, elevation and section drawings, parts list and specifications. Alternative constructions are shown and described. (16 pp.)

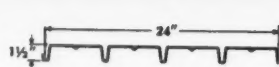
AIA FILE NO. 35-H-6
MFR: PENN METAL CO., INC.
Circle 333

FOLDING PARTITIONS

Soundguard folding partitions, designed to effectively separate both space and sound, are subject of 1960 catalog. Mfr attributes sound isolation to units because of denser insulation within partition and complete perimeter sealing to prevent sound from passing around jambs and operating edges. Such features as steel frames, track designs and trolleys which are said to be easily operated, and draped appearance are covered.

Circle 139 for further information →

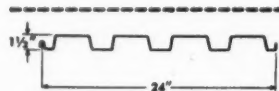
Steel deck or centering...you name it, INLAND has it!



A-DECK — For purlin spacings not exceeding 8'4". Narrow ribs provide deck surface that supports the thinnest or softest types of insulation.



H-DECK — New! For simple spans to 20'0" — 3" and 4 1/2" depths. Especially practical to cover walkways in shopping centers, schools, other installations.



B-DECK — For spans to 10'0". Wide rib distributes metal for greater structural efficiency. Well suited for use as side wall panels.



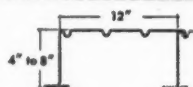
B-ACOUSTIDECK — Two-in-one panel combines steel roof deck with acoustical ceiling having Noise-Reduction Coefficient of .70. Used for spans to 10'0".



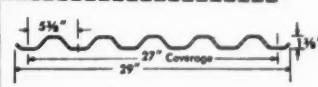
C-DECK — Carries normal roof loads over spans up to 24'0". Used extensively in canopies.



C-ACOUSTIDECK — Offers same Noise-Reduction Coefficient as B-Acoustideck. Can be used for spans to 24'0".



T-STEEL — New! Galvanized only. For clear spans to 32'0". Adaptable to acoustical and flush, luminous ceiling treatments. Provides superior diaphragm to resist seismic and wind loads.



RIBFORM — High-tensile, galvanized steel form for concrete slabs over spans up to 8'0". Three types: Standard, Heavy-Duty, Super-Duty (shown).

Expansion projects and new buildings get under cover fast and economically, when you specify an Inland roof system.

Inland steel deck is easy to handle and weld in place — in any weather that a man can work. Effects of construction abuse are held to a minimum, since types A, B, C, and H decks are Bonderized, then covered with a baked-enamel primer that resists on-the-job damage. One field coat of paint over this is usually enough.

In concrete-over-steel construction, Inland Ribform supports wet concrete with minimum deflection. Rigid sheets are quickly and inexpensively attached to supports — in place, they provide a safe work platform for crews.

Write for catalogs 240, 241, and 245 — see Sweet's sections 2c/Inl, 11a/In, and 2a/In. For help on unusual problems, you can draw on the diversified experience of Inland sales engineers. Write or call your nearest Inland office.

member of the



ENGINEERED PRODUCTS DIVISION

**INLAND STEEL
PRODUCTS COMPANY**

Dept. E, 4137 West Burnham Street
Milwaukee 1, Wisconsin

EP-5A

LITERATURE

Suggested applications include offices, churches, schools and auditoria.

AIA FILE NO. 35-H-6

MFR: HOLCOMB & HOKE MFG. CO., INC.

Circle 334

COMMUNICATIONS/TESTING

SIGNALING SYSTEMS

Current literature describes and illustrates systems and equipment for providing communications in all types of apartment houses. Included among equipment are vestibule telephones, call button plates, tilting mail boxes, directories, suite telephones, master equipment and battery eliminators. Sample specifications, system wiring diagrams and selection guide are included. (12 pp.)

AIA FILE NO. 31-i-51

MFR: S. H. COUCH CO., INC.

Circle 335

AMPLIFIER SELECTION

Amplifier selection guide available to aid in choosing correct amplifier for each sound application. Guide presents 21 amplifiers and preamplifiers ranging from 1 watt broadcast type program units to 75 watt sound system power amplifiers. Units are illustrated and details are given on frequency range, inputs, controls impedances, output voltages, gain and applications.

AIA FILE NO. 31-i-7

MFR: AUDIO PRODUCTS DEPT., RADIO CORP. OF AMERICA

Circle 336

TESTING APPARATUS

Recent publication pictures and describes improved testing apparatus relating to soils, bituminous, concrete and general testing. Included are: (1) for cement and concrete testing—capping compound, portable electric vibrator, test hammer and California sand equivalent test; (2) for soils—pocket penetrometer for strength tests, miniature compaction apparatus, pocket sized compression tester and piston sampler, drilling rig and soil sample ejector; (3) for bituminous—large capacity reflux extractor. (16 pp.)

AIA FILE NO. 35-E-2

MFR: TESTLAB CORP.

Circle 337

MOISTURE/DENSITY PROBES

Current bulletin describes *Nuclear-Chicago d/M-Gauge* for surface moisture and density measurements of soils and similar materials. Units are designed for use by engineers, agronomists, scientists and contractors. Bulletin gives specifications for instruments, and photographs show



One slight push and big doors open surely and easily... when guarded with CORBIN Automatic Exit Fixtures.

Structurally dependable, they give *instant*, unfailing performance... meet safety standards everywhere—in schools—hospitals—churches—theaters—all public buildings.

Functionally styled, with choice of

trim to suit all requirements... masterkeyed with other CORBIN Locks, if desired.

Available in cast brass, bronze or aluminum... in all standard finishes... for single doors, for double doors... for entrance and exit, for exit only. *Exclusive feature: all lever arms are drop forged, and equipped with oilite bearings.*

Here is CORBIN craftsmanship at its best!

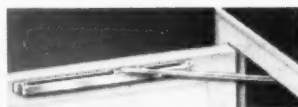
Circle 140 for further information

BIN



FINISHING TOUCH FOR PERFECT DOOR PERFORMANCE

CORBIN "880" HEAVY DUTY OVERHEAD DOOR HOLDER



Top performance for either exterior or interior doors. Dependable CORBIN quality evidenced by the following features: Inconspicuous... rugged... greater holding area... front mounted "off-and-on" lever... tension control screw easily accessible... 110 degree opening... heavy extruded brass track... extruded brass slide... deeply case-hardened dog and latch... concealed buffer spring... forged brass end brackets.

CORBIN BALL BEARING PIVOT HINGES



Top, Intermediate and Bottom Pivot Hinges to meet any load requirement. Completely sealed and lubricated for a lifetime of smooth, trouble-free, truly anti-friction performance. Outstanding feature: *adjustable* to permit raising and lowering of door to equalize the load on load-carrying pivots. Radial roller bearings and ball thrust bearings.

Ask your CORBIN Distributor for complete details.

IT PAYS TO MAKE IT CORBIN—THROUGHOUT!



P. & F. CORBIN DIVISION

THE AMERICAN HARDWARE CORPORATION
NEW BRITAIN CONNECTICUT

correct usage for both moisture and density tests in conjunction with soil compaction work. Two models available: model NU-3 to accurately measure amount of moisture in materials, without necessity for mathematical calculations, and model NU-2 for density measurements on organic or inorganic materials. (2 pp.)

AIA FILE NO. 1-D

MFR: SOILTEST, INC.

Circle 338

PAINTS/GLASS

GLASS FOR SCHOOLS

Recent creative uses of modern glazing materials, complete with particular functional requirements they fulfill, are pictured and described in folder entitled, *New Light on Learning*. Folder details how architects and planners of schools can find a practical, economical glass for most purposes in a variety of types, designs, colors, sizes and optical characteristics. (4 pp.)

AIA FILE NO. 26-A

MFR: AMERICAN-SAINT GOBAIN CORP.

Circle 339

FIRE-RETARDANT PAINTS

Illustrated, *Bulletin #100*, offered to explain fire-retardant paints for applications in all types of industrial, commercial and institutional buildings, to improve safety and reduce potential fire damage. Explanation of UL flame-spread ratings included, in addition to discussion of relative costs of materials and labor in applying conventional decorative paints and fire-retardant material. (12 pp.)

AIA FILE NO. 25-B-28

MFR: ALBI MFG. CO., INC.

Circle 340

COLOR FINISHES

Color card of industrial finishes offered, providing some 64 shades. Available in lacquers, synthetics, vinyls and specialty finishes in complete scale of lustres at six levels, finishes include wrinkles, metallics, stain, crystal lacquers, clear lacquers and others. Includes 1960-1961 *House and Garden* shades. Card furnishes detailed descriptions of each finish.

AIA FILE NO. 25-B-2

MFR: UNITED LACQUER MFG. CORP.

Circle 341

SILICONE GUIDE

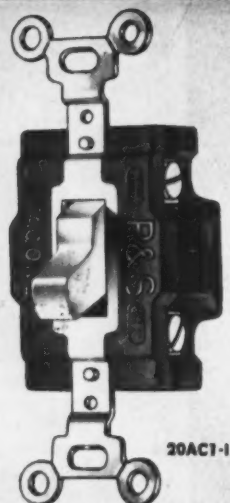
Topical brochure offered as engineering guide; comprises summary of forms, properties and applications of silicone materials, resistant to effects of time, heat, moisture, weathering, oxidation and chemical attack. Products included range from adhesives to release agents, laminating resins to rubber compounds, electrical insulation to water repellents. For easy reference, table of contents is arranged according to applications.

Circle 140 for further information

SPECIFIED FOR RUGGED DUTY

P&S SUPER AC SWITCHES

- Extra large terminal screws.
- Extra large silver buttons.
- Can be used to full rated capacity on inductive loads.
- Contacts in upright position mounted at point of least vibration.
- Available in 15 and 20 Amp. types.



Send for complete catalog, Dept. AE-56

P&S
PASS & SEYMOUR, INC.
SYRACUSE 9, NEW YORK

60 E. 42nd St., New York 17, N.Y. 1440 N. Polaris Rd., Chicago 51, Ill. In Canada: Reprow Electric Co., Ltd., Toronto, Ontario
Circle 141 for further information



planning a school or library?

get help
from these 2
STACOR
equipment
catalogs

They show space-saving, economical, attractive units . . . ways in which to use them . . . features that have made the Stacor name famous for well designed, well made, well accepted equipment.

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Circle 142 for further information

LITERATURE

Brochure contains photographs, tables and graphs. (16 pp.)
AIA FILE 25-A-3
MFR: DOW CORNING CORP.
Circle 342

MISCELLANY

CERAMIC GRILLES

Recent brochure illustrates and describes 12 standard grilled designs now available in *Ceramic Veneer*, terra cotta material, in range of colors. Line, intended to permit architect greater design freedom and creativity, is designed for solar screens and perforated facades for sun control, ventilation and privacy. (8 pp.)

AIA FILE NO. 35-P-2

MFR: FEDERAL SEABOARD TERRA COTTA CORP.

Circle 343

POLYETHYLENE FILM

Illustrated booklet offered, describing various types and uses of *Visqueen* polyethylene film. Booklet covers characteristics of material in packaging, construction and industrial fields. Listing and description of available types included. (16 pp.)

AIA FILE NO. 24

MFR: PLASTICS DIV., VISKING CO., DIV., UNION CARBIDE CORP.

Circle 344

LATHING SPECIFICATIONS

Specifications for Metal Lathing and Furring, currently available, was recipient of Honorable Mention award in recent Producers' Council Building Product Literature Competition at AIA Convention. Said to be result of intense research and development, booklet contains recommended uses for metal lath, shows fire-resistive ratings, design tables, specifications for partitions, ceilings and other similar data. (20 pp.)

AIA FILE NO. 20-B-1

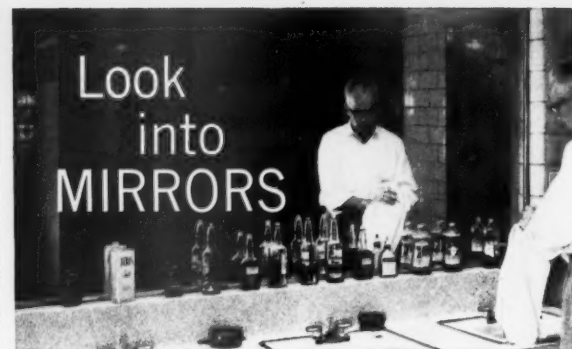
ASSN: METAL LATH MFRS. ASSN.

Circle 345

STRUCTURAL ADHESIVES

Illustrated file catalog available containing information on *Scotch-Weld* structural adhesives, structural adhesive design concepts, joint designs and bonding methods. Technical information, tables and line drawings deal with types and properties of one-part heat curing and two-part chemically curing adhesives, design methods for structural adhesive bonding, typical adhesive joint designs and fabrication methods, including surface preparation, adhesive application and bonding equipment. Case histories of solutions to structural assembly problems also

Look into MIRRORS



by Faries-McMeekan for

INDUSTRIES



RESIDENCES



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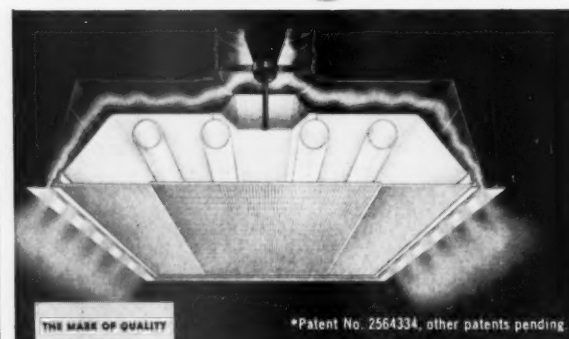
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for catalog

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Circle 143 for further information

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Architectural & Engineering News

included. Request catalog on letterhead, directly from: E. F. Hess, Adhesives, Coatings and Sealers Div., Minnesota Mining and Manufacturing Co., 900 Bush Ave., St. Paul 6, Minnesota. (16 pp.)

AIA FILE NO. 24-A

MFR: MINNESOTA MINING AND MANUFACTURING CO.

Write MFR directly

DISTRIBUTION EQUIPMENT

Buy Log, 1960 edition, available, intended as condensed buying catalog for low-voltage distribution equipment, light and heavy duty safety switches, tumbler and open-knife switches, hinged wireway, circuit breakers, switchboards, motor control centers, sectional distribution centers and all types of panelboards and busway. Features of catalog include: selector charts for each type of product; pictorial descriptions; and cross referenced index. Ratings, weights, dimensions and ordering data also included. (84 pp.)

AIA FILE NO. 31-C

MFR: DISTRIBUTION UNIT, GENERAL ELECTRIC CO.

Circle 346

HYDRAULIC DOCKBOARD

Current file folder treats air-powered, hydraulic dockboard, designed for installation on loading docks in terminals, warehouses and manufacturing plants. Specifications, installation diagrams, air compressor charts and data and construction details for cantilevered and fabricated frame docks included for *Aero-Board* units.

AIA FILE NO. 35-i-141

MFR: SALES ENGINEERING DEPT., ALLIED PRODUCTS DIV., FREIGHTLINER CORP.

Circle 347

CABINET BROCHURE

Brochure available, featuring *flairwood* cabinet line for kitchens. Details are given on types of available units, in addition to complete specification and feature data. Insulation information also included for units.

AIA FILE NO. 35-C-12

MFR: CURTIS COS., INC.

Circle 348

FLOOR PROTECTION

Recently prepared leaflet, entitled, *Floor Protection Devices for Hospital Equipment*, provides recommendations for use of casters, wheels and glides on hospital equipment and furniture. Purpose is protection against marring and indentations of asphalt and vinyl asbestos tile floors. Listing of recommended minimum sizes presented. (2 pp.)

AIA FILE NO. 27-C-1

ASSN: ASPHALT AND VINYL ASBESTOS TILE INSTITUTE

Circle 349

ALPHA

BETTER CONSTRUCTION THROUGH
BETTER USE OF CEMENTS

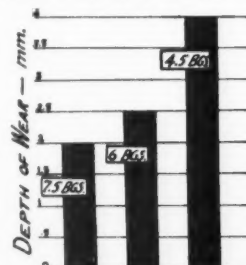
news and notes from the field

7 Factors Affecting Life of Concrete Floors

Long-wearing concrete floors are easy to build if a few practical steps are observed in designing, placing and curing them. Naturally, the most important part of the floor is its wearing surface. The hardness or "wearability" of the surface is of special importance for such jobs as industrial floors, warehouses, loading platforms, etc.

Through years of on-the-job study and extensive research work, Alpha has found that the following 7 factors must be considered if floors are expected to endure heavy wear. *Please note that these factors are not short cuts and also you can't omit the importance of quality materials, good supervision and good workmanship.*

1. The Cement Factor



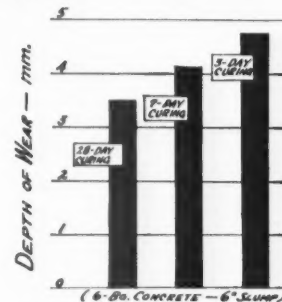
EFFECT OF CEMENT FACTOR
ON DEPTH OF WEAR
(2" slump and 28-day curing)

A 7.5-bag mix will wear 20% better than a 6-bag mix and 100% better than a 4.5-bag mix at the same slump and with the same 28 days moist curing.

2. Slump of Concrete

By reducing the slump from 6" to 2", the wearability of floors made of 4.5-bag concrete will be increased by 15%.

3. Length of Moist Curing Time



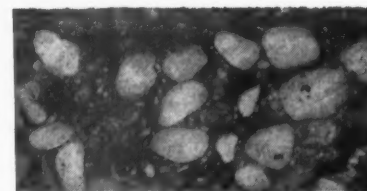
EFFECT OF MOIST CURING TIME
ON DEPTH OF WEAR
(6-bag concrete, 6" slump)

The higher the slump the more the concrete is affected by improper curing. The chart above shows how moist curing improves the wearability of 6" slump concrete.

4. Compressive Strength

For all practical purposes, the wearability of concrete is directly proportional to its strength. Example: 6000 psi concrete wears over four times better than 1800 psi concrete.

5. Finishing Concrete



Overtroweling will cause the finest particles and water to rise to the top, thus resulting in a low strength surface skin. The importance of troweling at the right time can be seen in the fact that the

surface skin of 0" to 4" slump concrete can show the same amount of wear. Water and fines brought to the surface through careless troweling of lower slump concrete reduces the surface strength until it is no better than higher (up to 4") slump concrete. The surface hardness of 4" slump concrete is 100% better than 10" slump concrete.

6. The Type of Cement

In cases where concrete is subjected to wear at an early age, provision must be made for high-early concrete strength. This can be done by using hi-early cement or a higher cement factor where Type I cement is used. Such conditions vary too much for specific recommendations here, but Alpha's field engineers are always available to users of Alpha products to assist in determining the proper construction method for special conditions.

7. Drying After Curing

If concrete is permitted to dry after proper curing, its surface skin strength is almost doubled. It is advisable, therefore, to allow at least one day of drying after moist curing before the floor is subjected to heavy wear.

Good sound aggregates are important, but it is the mortar binding the aggregates together that determines, for the most part, the wearability of the floor. There is no short cut to quality concrete and as has been proved time and again, the right way is the most economical in the long run.

Note: All data on this page are approximate and intended for general guidance and not specific rules in concrete floor design and construction.

Reprints of the helpful information presented on this page are available on request.

ALPHA

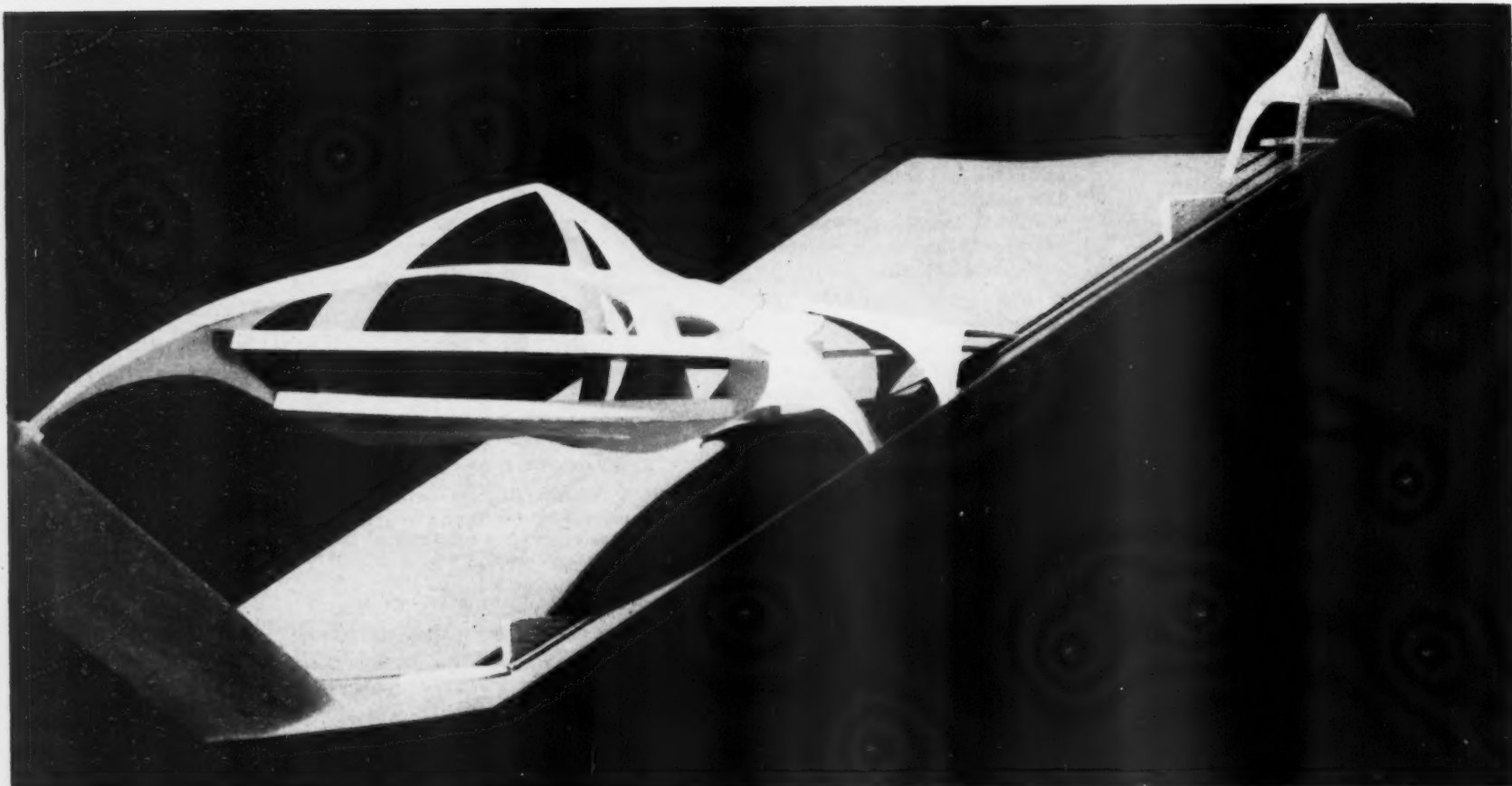
PORTLAND CEMENT COMPANY

Alpha Building, Easton, Pa.

Circle 152 for further information

Dimond Canyon Restaurant
Oakland Park Department
Luckman and Cadwalader, Oakland, Calif.
Dimond Park, Calif.

project
 client
 architects
 location



Plan elements

It is intended that this restaurant shall be one of the most elegant in the San Francisco Bay area—in service, cuisine and setting. The upper floor will provide a cocktail lounge and bar in conjunction with the main dining room, and extensive decks for outdoor dining. The lower floor is to house a banquet room, decks and golf “pro” shop facilities. A snack bar and cocktail lounge for the golfers are in close relationship to locker facilities and a golf deck. The golfers will have a choice of driving off this deck, which is some 50 feet above the driving range, or of driving from the ground below. Kitchen facilities are divided between the two floors, and will be internally connected with dumbwaiters.

Parking is at the upper edge of the canyon. Passengers may be deposited at the entrance structure, where protection will be afforded from wind and rain. A dramatic view of the entire canyon area and the building will be had from here, and one will be able to see thru the glass dome into the main dining room. Glass enclosed funicular cars will carry passengers to the protected bridges at each level, or down to a terraced promenade area below the building. Consideration has

been given in the building design to seeing it from all angles, including from above and below.

The multi-faced glass dome which rises 30 feet above the dining room floor will be a mixture of clear, tinted and heat absorbent glass, carefully arranged for color, pattern, view thru the dome and sun control.

General features

The extraordinary site for this building is a 150-foot deep canyon, lushly lined with native oaks. This setting is part of an extensive natural park area, which is ten minutes from downtown Oakland, Calif. A pitch-and-putt golf course and a golf driving range are being developed at the bottom of this canyon. The proposed building will be located between these facilities. It will span the canyon at a height where it will be protected from wind, be removed from traffic and parking areas and still be high enough for a distant view of San Francisco Bay, framed by the canyon walls. The project is in a preliminary stage of development.

Structural notes

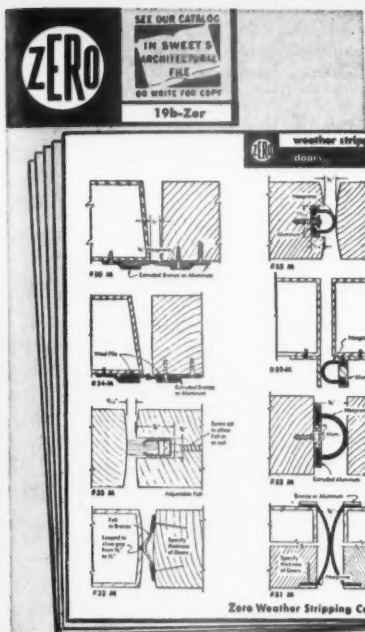
The structure is to be of reinforced concrete, with pre-

casting and pre-stressing employed wherever practicable. The tripod form of the main bents will allow for vertical displacement of the canyon walls due to earthquake action, and roller connections at the three bearing points will absorb unsynchronized horizontal movement of the canyon walls.

The primary structural units are the three main concrete bents. These connect to each other at the top of the glass dome and underneath the lower floor. They will be precast on the site and raised into place, forming the main supports and bracing at the same time. The floors and partial concrete dome will be carried by the bents, and will in turn stiffen the bents. The domed roof will be of precast pan units. Each level of the connecting bridge structure will rest on rollers against the main building, leaving it free to act as a true tripod. The three main bearing points will be carried to bed rock.

Areas and costs

Total approximate area main building	22,500 sq. ft.
Approximate area of entrance structure	1,200 sq. ft.
Estimated costs	\$600,000



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Circle 145 for further information

May 1960

DIGEST:17

LIGHTWEIGHT AGGREGATE FOR INSULATING CONCRETE

Editor's note: This month's digest concerns itself with "Perlite," the processed siliceous volcanic rock, which has found wide application in building construction. Since A/E NEWS does not function as a testing laboratory, the information given below is presented for the reader as an editorial service. Prepared from material released by the Perlite Institute, it is left to the discretion of the practitioner to make his own evaluation of the information contained therein.

General information

Perlite, the siliceous mineral rock made from volcanic lava, is rapidly finding an important place in the construction industry and several other fields. Although its greatest use today is as a lightweight aggregate for plaster and insulating concrete, Perlite is coming into its own as an additive to paints, ceramics, foundry sands, oil and gas well cements and muds; as a filtration medium; pipe, furnace and boiler insulator; abrasive; plant rooting medium and soil conditioner; carrier for insecticides and weed killers; and as a light-weight cushioning and packaging medium.

Technical description

A siliceous volcanic rock, surface-mined in the Rocky Mountain region of the United States, Perlite is processed by crushing and quickly heating to above 1,500° F. It then expands to form lightweight, non-combustible particles of cellular structure. This material, white in color, weighs from 2 to 15 pounds per cubic foot. Its average weight of 8 pounds per cubic foot is approximately 1/12 the weight of sand. Solid concrete made with Perlite actually floats on water. Chemically, Perlite consists essentially of the oxides of silicon and aluminum combined as a natural glass. It is considered rot-proof, vermin-proof and fungus-proof; and is reported not to deteriorate with age.

Construction properties

About 90 per cent of expanded Perlite is used for construction purposes. When mixed with gypsum and water in lieu of sand, Perlite creates a plaster that can be troweled or sprayed on lath to form an extremely lightweight resilient wall or ceiling that can withstand stresses and thermal changes that could damage ordinary plasters. Perlite insulating concrete, which can be used as fill or for roof decks and sub-flooring, can be used in pre-cast slabs or poured on lath, formboard or steel decking, and can be sprayed as a back-up for aluminum or steel spandrel panels or curtain walls. Because a ton of Perlite plaster or concrete will cover three to five times as much area as mixes made with ordinary aggregates, structural designers have been able to save as much as 34 per cent on the cost of steel

framing in multi-story buildings. A significant saving has also been realized in labor costs due to the ease of handling and applying plaster and concrete made with Perlite.

Fireproofing and insulation

Perhaps one of its best properties is its extremely low thermal conductivity. Because an ounce of the material is composed of thousands of tiny dead air cells, the aggregate is fireproof and makes an excellent insulator.

Perlite-gypsum plaster has a thermal conductivity "k" factor (Btu/hr/sq. ft./°F/inch of thickness) of about 1.25, as compared with standard sand and gypsum plaster which has a "k" factor of about 5.6. Loose Perlite itself has a "k" factor ranging from 0.26 to 0.48, depending on density. It is considered a preferred insulation for liquid oxygen tanks at temperatures as low as -300° F. Perlite concrete has been demonstrated to be up to 20 times less conductive than standard sand and gravel concrete; thus a one-inch thickness of Perlite concrete is considered to provide more insulation than a one-foot thickness of ordinary concrete. Perlite plaster is considered one of the most efficient fireproofing materials known. Tests by Underwriters' Laboratories show that a one-inch thick Perlite-gypsum plaster ceiling provides four-hour fire protection for steel floors and beams, while a 1½-inch thick membrane around steel columns is the thinnest coating of any material approved by building codes for a four-hour fire rating.

Acoustical properties

Because Perlite aggregate has a very low density due to its internal cellular structure, it is highly effective in absorbing sound. It has become a basic ingredient in many acoustical plasters and in some acoustical tiles. In wall constructions where dense materials are often preferred, tests by the National Bureau of Standards and Riverbank Acoustical Laboratories have given Perlite plaster high ratings for effective reduction of sound transmission, particularly when the plaster was applied by spraying.

Construction applications

PLASTER—As a widely used plaster aggregate, it en-

DIGEST:17

joys better than 40 per cent of the market. It provides a monolithic surface that is as permanent as the building itself and has proved excellent for painting and papering. Because *Perlite* plaster weighs 60 per cent less than ordinary sanded gypsum plaster, it saves about one ton of dead weight for every 100 sq. yds. of ½-inch thick plaster. In the average home this weight saving can amount to 4 or 5 tons. In commercial buildings *Perlite* plaster on metal lath can eliminate as much as two tons of dead weight per 100 sq. yds. of plastered surface. Used for fireproofing structural steel, up to 80 per cent of the dead load of the fireproofing can be eliminated by substituting the lightweight plaster and lath membrane for heavy concrete or masonry encasement of columns, beams and girders. *Perlite* plaster aggregates carry the uniform Certification Seal of the *Perlite* Institute throughout the country and are periodically tested by an independent laboratory to insure strict conformance to *ASTM* specifications.

CONCRETE—Considered by its producers stronger and more durable than ordinary insulating materials, *Perlite* concrete is stated to be an economical fill insulation over structural concrete, wood or metal roof decks. On flat roofs, the thickness of the *Perlite* concrete can be varied to provide drainage slope as well as insulation. When placed over permanent forms, such as paper-backed welded wire mesh, ribbed metal lath or various formboards, *Perlite* concrete combines the functions of roof deck and insulation in one low-cost slab that needs no additional insulation. *Perlite* concrete screeds smooth without steel troweling and makes an excellent non-flaking base for bonded built-up roofing. It can also be used as non-load-bearing fill in bridges, tunnels, and other types of construction. *Perlite* concrete slabs also have the virtue of high nail-ability and can be sawed like wood.

LOOSE FILL—Unmixed *Perlite* is rapidly gaining acceptance as an insulating fill for lightweight concrete block walls. By filling the cores of the blocks with *Perlite*, the insulation is kept inside the wall where it is out of the way, can't be damaged and prohibits the use of the dead space as a nesting place for insects or vermin. Core insulation is particularly effective when used with lightweight concrete blocks made with expanded slag, clay or shale aggregates. By filling the cores of such blocks with *Perlite*, heat losses through 8-inch thick walls can be cut by 54 per cent. Even when heavier blocks made with limestone and gravel aggregates are used, *Perlite* core fill cuts heat losses by about 35 per cent. *Perlite* is also considered effective as a cavity wall insulation and as an insulating fill in the attic floor of the home.

Industrial uses

OILWELL CEMENT—The oil industry is harnessing *Perlite's* flexible properties to prevent "lost circulation" of drilling lubrication fluids into porous sand formations, fissured or cracked formations, cavernous formations, or lifting of the overburden through the use of high fluid pressures. For all but the last mentioned case, successively smaller size particles of expanded *Perlite* are introduced into the fluid to bridge openings in the well hole walls. Mixtures of *Perlite* and Portland cement can also be safely pumped into the wall for this purpose.

MINERAL FILTER AID—It is finding new acceptance as a mineral filter aid, and is particularly adapted for situations where a high flow rate is more important than crystal clarity of the filtrate. *Perlite*-filled filter presses have been used successfully for citrus and other

fruit extractions, and in the processing of sugar. Swimming pool owners find it an excellent water filter.

PIPE, FURNACE AND BOILER INSULATION—Because *Perlite* has such low thermal conductivity ("k" factor), compositions of the lightweight mineral have been found to give maximum pipe insulation at a minimum cost. Even when heated beyond 1,200° F compression molded pipe insulating sections do not break down. Similar *Perlite* compositions are being used to insulate boilers and hot water tanks and other high temperature equipment.

FOUNDRY USES—*Perlite* is successfully being used in many foundries as mold insulation where it reduces shrinkage defects in the resultant casting. Added to molding sands, *Perlite* reduces cutting and scabbing defects in castings by allowing for easy escape of gases created in the casting process. When added to core sands, *Perlite* helps maintain better resistance to erosion of the core by molten metal, thereby minimizing penetration to veining of the core surface. Loose *Perlite* is also used as a ladle cover to insulate the surface of molten metal when delays in pouring occur.

ABRASIVES—Abrasive bodies, such as grinding wheels, discs, segments, rubs, and similar articles, are now being manufactured with *Perlite* bonded with low temperature binders. *Perlite's* porosity, resistance to disintegration and light weight allows for cooler and safer abrasion. Its light minimizes centrifugal forces tending to rupture high-speed grinding wheels.

CERAMIC AND PAINT ADDITIVE—*Perlite* added to the usual ingredients of ceramic brick, pottery, glass and tile will add to their insulative properties, reduce density (weight per sq. ft.) and permit easier handling and lower freight costs. *Perlite* granules are also widely used as an additive to paints where a textured finish is desired.

Architectural applications

The list of buildings which have used *Perlite* is varied and long, ranging from the U.S. Capitol and United Nations Building down to single story residences. One of the most outstanding buildings is the Alcoa Building in Pittsburgh, considered one of "the lightest office buildings of its size ever built," by its engineers. Its exterior walls consist of 4-inch thick *Perlite* concrete faced with aluminum. Its 30 floors contain 310,000 sq. ft. of rentable space above the first floor, yet its lightweight construction permitted a saving of 6,500 tons of structural steel.

Lightweight *Perlite* concrete has been adopted to insulate shell-type roof construction, such as the transportation building of Denver's Mile High Center. A three-inch curved structural shell was used with the insulating concrete put directly on top of it. Use of *Perlite* allowed the lighting fixtures to protrude up through the thin structural shell without necessitating special fittings and flashings. Despite the lightweight of the *Perlite* concrete, it achieved the specified 28-day compressive strength of 600 lbs. psi without sacrificing insulation or cost considerations.

Another *Perlite* application was in the world's largest sub-zero storage warehouse recently completed for Continental Freezers of Illinois, Inc., in Chicago. More than 275,000 cu. ft. of *Perlite* concrete was used to insulate the floor and roof deck.

One of the largest installations of *Perlite* concrete is at the Kentucky State Fair and Exposition Center which opened in 1956. Seventeen acres of *Perlite* insulating concrete was laid on roof decks over exhibition halls and the coliseum.

BOOKS

1960 Building Products Register published by The American Institute of Architects, 1735 New York Ave., N. W., Washington, D. C. Yearly subscription \$25.00.

The AIA, in producing the first edition of its annual *Building Products Register*, has not only launched a significant technical service—but has provided an exceedingly useful professional tool that will be welcomed by both architects and producers of this nation's vast building products industry. As a reporting service and reference manual, it should prove to be a consistent time-saver.

Until now, architects have not had immediately available, in one volume, an adequate comparative survey of building materials. The information given in the AIA publication is impartial and factual in presentation; no attempt has been made to usurp the function of a testing laboratory, nor to supplant product literature. Its stated aim is to promote better use of products through increased knowledge of their significant characteristics. It is a carefully documented and well organized effort.

Since our publication places great emphasis on technology and new product developments, we welcome the *Building Products Register* as a valuable resource for our own editorial work. JJC

Modern European Architecture by A. Dorgelo, B.N.A. Princeton, N. J.: D. Van Nostrand Co., Inc., 1960. 252 pp., illus. \$27.50.

Covers designs from 16 different countries, with illustrations, drawings, and information on construction and materials.

Architectural Rendering, the techniques of contemporary presentation by Albert O. Halse, AIA. New York: F. W. Dodge Corp., 1960. 275 pp., illus. \$15.75.

Covers in text and illustrations every technique and medium used in architectural rendering today. Treats interiors, exteriors, nature, perspective, lighting, reflections, textures, all of the media in detail, materials and how and when to use them.

Chemical Analysis of Resin-based Coating Materials. New York: Interscience Publishers, Inc., 1959. 630 pp. \$19.50.

Written by 26 experts, this book summarizes the scattered international literature on analysis of resin-

based coatings. Contains, in addition to detailed specific procedures and calculations, discussions on general analytic techniques and on physical properties and chemical composition of coating components. Chapter bibliographies, diagrams, tables and graphs included.

Handbook of Heavy Construction edited by Frank W. Stubbs, Jr. New York: McGraw-Hill Book Co., Inc., 1959. Various paging, illus. \$18.50.

Presents working information on estimating requirements, performing field operations, operating and maintaining equipment, best utilization of materials, figuring costs, managing projects, etc.

Electrical Engineering for Professional Engineers' Examinations by John D. Constance. New York: McGraw-Hill Book Co., Inc., 1959. 448 pp., illus. \$9.50.

Written expressly to help in preparation for electrical engineering examination for professional engineers. Comprehensive compilation of basic concepts, techniques, and practical calculations arranged for quick review. Problems with solutions, most of them from past examinations from many states, immediately follow definitions and general descriptions.

Mathematics for Communication Engineers by S. J. Cotton. New York: The MacMillan Co., 1959. 245 pp. \$7.50.

Mathematics is considered as a tool that communication engineers can use in dealing with their particular problems. Some of the sections are directed toward specialists in one or another of the branches of communications.

films

This is Comesto available through The Celotex Corp., 120 S. LaSalle St., Chicago 3, Ill. 16 mm., sound and color, 20 minute running time.

Describes applications and features of curtain wall construction using company's insulating panels. Shows curtain-wall installations in manufacturing plants, shopping centers, schools, apartment buildings and residences.

Planning Hot Water Systems for Commercial Uses available through the Permaglas Div., A. O. Smith Corp., Kankakee, Ill. 16 mm., color and sound, 30 minute running time. Provides instructional data on the latest trends in hot water supply system design, heater specifications and other materials connected with designing a hot water supply system.

Circle 146 for further information →



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If it's expected to stay for life, then, of course

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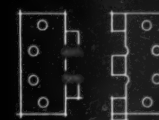
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Circle 147 for further information



NAMES

EMANUEL N. TURANO, AIA is an architect who loves a challenge. In fact, by his own admission, he cannot resist a challenge. The development of his career has been marked by the belief that there is always a new solution for an old problem, and through a pervasive curiosity and a sharpened sense of inventiveness, one can bring about such a solution.

This sense of invention, curiosity and an insatiable interest in science and its literature, has underscored all of Turano's endeavors.

Prior to his entry into architecture, he once engaged in chemical research on aniline dyes, working closely with Eastman Kodak on developing new sources. He also functioned as a consultant on industrial processes.

In 1937, an interest in painting (which he still pursues) led to application and enrollment in The Cooper Union for the Advancement of Science and Art. Here his natural inclination to design and build opened a new world of experience and ultimately his studies were directed to architecture.

After completing his studies at Cooper Union, Turano entered the U. S. Army in 1941, where he served as part of the Sea Coast Research Board, the nucleus of the group, which dealt with anti-aircraft research.

Later, he was transferred to the U. S. Army Air Force, where as a bombardier, on active combat duty in the Central Pacific, he was to be awarded the Distinguished Flying Cross (DFC).

While stationed in the battle-torn Central Pacific area, he directed the building efforts on his barren coral island base, where, according to Turano, "We built everything."

With the war's end in 1945, Turano returned to attend the Graduate School of Design at Harvard. There he studied with Walter Gropius, FAIA, completing the three year program within a year and one-half. After Harvard, he joined the firm of Skidmore, Owings and Merrill. His work on the design team there covered many projects, including the then-pioneering Lever House.

In 1951, he left SOM and briefly worked with Kelly & Gruzen as Chief of Design, before entering private practice in 1952 with Philip Ives, AIA, and Louis Gardner, AIA. Here, Turano's consistent interest in always seeking fresh solutions for old problems has found ample fulfillment in the work of his firm. Turano most painstakingly cautions that one should not seek newness nor innovation for its novel effect—but rather as the inherent or potential expression of a broader horizon for architectural form and function.

As if to prove its point, the firm of Ives, Turano and Gardner recently received an award for outstanding design by the New York State Assn. of Architects for the Sterling Forest (N.Y.) International Research Building. The *Forum* characterized this building as "a promise that civilization may indeed be brought to the forest [the project's ambitious program] with skill and sense."

Another project recently designed by the firms of Turano-Gardner Associates and Merchant-Seidel-Hickey (and now under construction) for low rent housing for the elderly in New Brunswick, N. J., may well become a prototype and may create a new series of PHA requirements for this kind of housing. Designed within the stringent PHA housing requirements, but offering aesthetic and functional values seldom found in public housing, this project offers a design solution with great flexibility. The scheme is based on a one-bedroom efficiency unit as the basic module. This unit can be readily converted to a zero- or two-bedroom unit by the closing of either one of two soundproof wall panels. This permits great flexibility in apartment size and utilization without additional construction or alteration. Turano takes time from an active practice and his activities with various professional organizations to teach. A member of the faculties of the Schools of Architecture at both Columbia University and Pratt Institute, he is presently teaching the Master's Studio at Pratt. In his teaching, he infuses his students with the attitude of searching for "facts and figures" as the preliminary step to "opening-up" any problem in design. His students are encouraged to constantly look for a fresh, exciting solution and when he sees an offering of design clichés, he will drop one of his favorite comments (applicable in his practice also), "experience is no substitute for brains."

Turano continues to pursue his interests in scientific literature and research despite the demands of a strenuous schedule as practitioner, professional and educator. He and his wife, Sybil, make their home in Long Island, together with the three "Els"—their little daughters, Leslie, Laura and Lisa.

ENT (as he is becoming to be known) is one of the profession's younger men—but one may rest assured, that in the not too distant future, he will emerge as one of architecture's ablest and best known designers.

EDITORIAL

This editorial is given over to some excerpted comments by D. J. Robert Oppenheimer, Director of the Institute for Advanced Studies at Princeton University. His address was given during the course of the 1960 AIA Panel on Technological Horizons of the San Francisco Convention. JJC

"I thank you for your very warm welcome, Fellows and members of The American Institute of Architects, and for this prayer that I come before you with diffidence. . . .

"I want to talk about some of the things that I see in this age of ours, the scientific age, unparalleled in human history.

"I know that it has created and has thoroughly created quite new problems and quite a few opportunities for the architects. But quite beyond that in our whole culture, in our whole society, it has brought traits with which men have never lived in the past, for which our tradition is a guide of limited, of strictly limited value. It has brought pressure to our society—and I speak to you in appreciation of the role which the architect has always and historically had, which you are living with, of bringing to these lesions a helpful and healing and creative hand. . . .

"I will be particularly concerned with what the growth of science and perhaps here I may make a distinction which I will have in mind throughout—between two images of the science which intertwine and reinforce each other but which are still the same. Science has increased knowledge, understanding, insight into nature and, increasingly slowly, into ourselves as a part of that nature. . . .

"The ingenuity to apply this knowledge to practical ends, which is technology and which leads to engineering, is the science that is most visible in our world. These obvious physical changes provide the architect and the engineer with countless new problems and also countless new answers to problems that have not yet been put. . . .

"Very good things have been written quite recently by economists on the nature of economic growth and what one may forecast for those parts of the world where it is only beginning and those parts of the world where it has not yet begun and I think you are more aware of its true nature than your speaker could possibly be.

"But turning to just what we know about the world, one of the most surprising and terrifying characteristics is the growth itself. For the last 200 years, scientific activity measured in any one of the natural quantitative ways—by the number of people engaged, by the volume of publication, or by more substantive criteria, has doubled essentially every ten years. . . .

"Compared to science as a whole, where we know four times as much as ten years ago, it is

not unlikely in some sciences, notably those having to do with molecular microbiology to hear of the last five years having produced more insight into the nature of life than in all human history.

"This sense of enormous growth of what is known is the most vivid experience of those who are part of it, part of the activity, however modest. This, of course, means that quite apart from the changes in the world which are based on this fact—that the world is now largely united in one communications network. The fact that travel to all parts of the world has made this not the problem of a hundred million people, but of two and a half billion; the fact that the whole structure of our communities, our industry, our work days, our leisure is altered. But besides this it means that the very substance of our cognitive growth is being changed many times over in a man's life; that when he went to school if he learned well and luckily in some fields most of what there was to know, twenty years later if he stopped learning—he will be an ignoramus.

"It means also that not only mature men today have to lead a life of continuing intellectual vigor and remain students if they are in any way to know what is going on in their specialized field. . . .

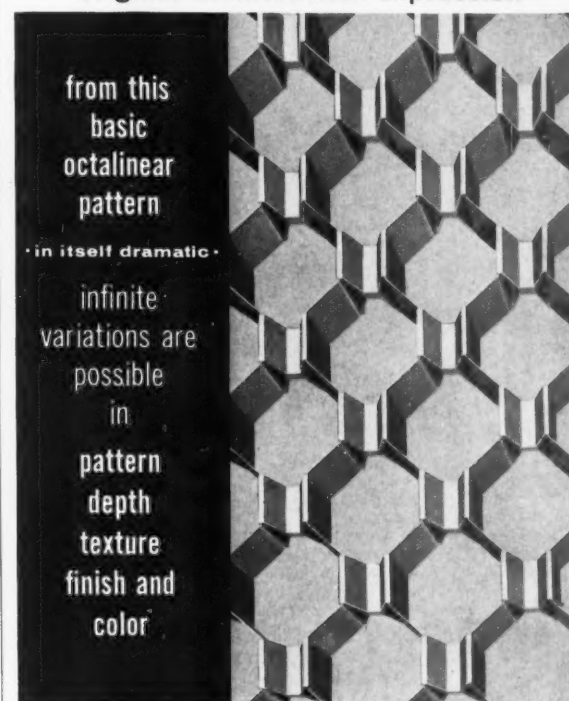
"But no civilization has ever put together the Greek notion of proof which makes for large logical structures so that when you find that you are in error, you learn a great deal and not just that somewhere in the loose line of reasoning that something has gone wrong. Put this together with the experimental techniques which also existed in Greece, were also known in Egypt, the inquiring gadgeteering technique and with the ideal of human betterment; the notion that we could fix things so that they were a little more agreeable here on earth. And this has produced an interlocking explosion of new knowledge, of new technology, of economic growth, each feeding back to the other, each enriching the other, but sustained by an ever-increasing, evermore rapidly increasing, expanding fund of insight into the natural world. . . .

"I don't know, and I say this with the utmost diffidence, it seems to me that the greatest hope I can express for your profession is that you will find it possible in your work of design and creation to look with very wide angle lenses at the site in which you are working. Ideally, perhaps, the city itself, the megalopolis or the province and perhaps, not necessarily ideally only, perhaps in reality, anyway at the very least in areas physically large enough to encompass what naturally meets the eye, what one sees in one's vision. . . .

"And I think we will come to see education not as a way of preparing people to take off and live, but as a way of preparing people to take off and live and love and know and continue to learn throughout their lives."

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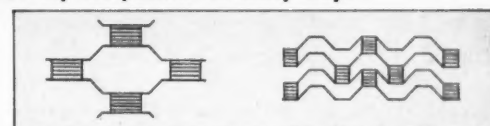
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depth
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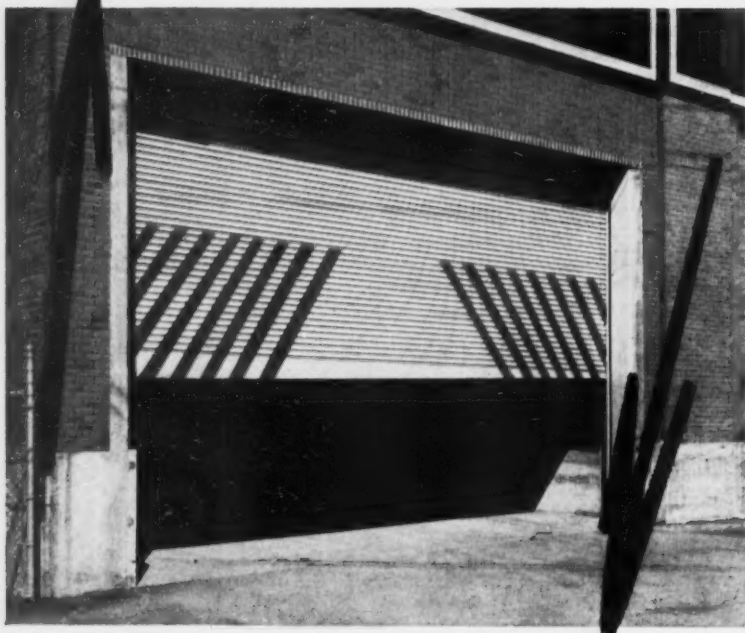


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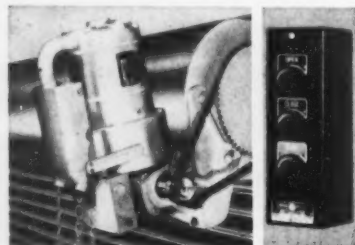
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New floor tile discovery from Romany·Spartan...

CERAMAFLEX*

rubber-cushioned ceramic mosaics in 9" squares

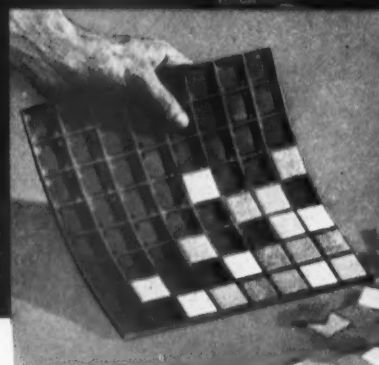
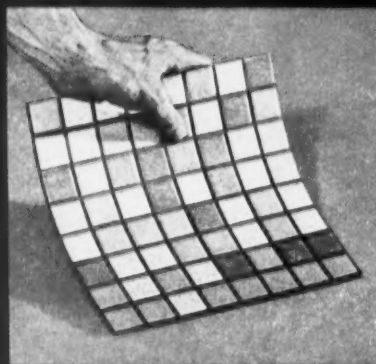


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It's flexible and resilient!

Ceramaflex, because of its unusual flexibility, adjusts automatically to minor imperfections in sub-floor. But the rubber grid which makes this possible serves other functions, too. Ceramaflex floors are quiet because they are mounted in *resilient* rubber which acts as a cushion between the ceramic mosaic tiles and the sub-floor, and they are easy on the feet. Heavy furniture and appliances can be moved without denting or harming the surface.

Tiles are mounted in rubber pockets!

Each of the 64 ceramic mosaics that make up one 9" x 9" unit is permanently bonded in a pre-formed rubber grid. Because the edges of Ceramaflex 9" x 9" units are beveled, they lay up so tightly that joints are unnoticeable in the finished job.

So easily installed!

Because Ceramaflex is pre-grouted, installation is simple and fast. It's ready for use the instant it's laid. Ceramaflex is installed with a special adhesive as quickly and easily as conventional resilient floor tile. It can be installed satisfactorily on or below grade as well as above grade, over proper sub-flooring. Simple, rapid installation results in application cost substantially lower than that of conventional ceramic mosaic floors.

To You, Mr. Architect, CERAMAFLEX opens a broad new field for floor application of ceramic mosaics. This labor-saving, high quality product embodies all the most-wanted qualities of ceramic tile, plus *two important additions*: floors that are both *quiet* and *easy on the feet*. This makes Ceramaflex a superior flooring material for many areas in schools, institutions, retail, commercial and industrial establishments. And in residential work resilient Ceramaflex can be used advantageously in kitchen and family rooms as well as the more frequently tiled areas.

Ceramaflex is as *new as tomorrow*, so if you don't yet have samples and information...call your nearby Romany·Spartan sales representative or distributor, or write for Bulletin RS-228. United States Ceramic Tile Co., Dept. AE-12, Canton 2, Ohio.

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CERAMIC TILE

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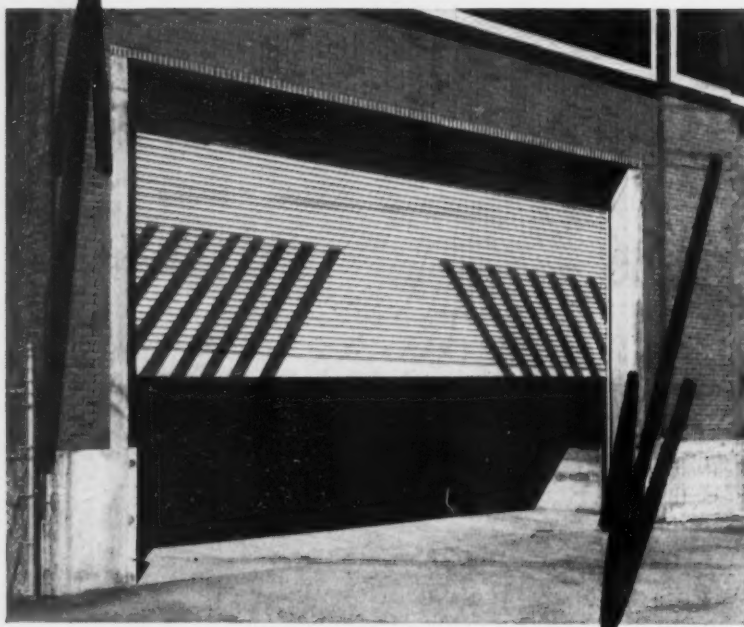
CONSTRUCTION. Made of Romany·Spartan unglazed 1" x 1" ceramic tiles which are securely bonded in a flexible rubber grid.

DIMENSIONS. Ceramaflex flooring units are 9" x 9" squares...and 1/2" thick. Each Ceramaflex floor unit is composed of 64 ceramic mosaic tiles approximately 1" x 1".

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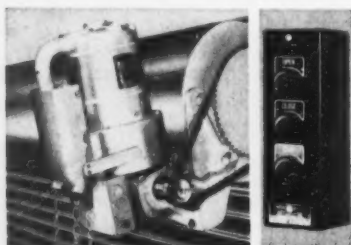
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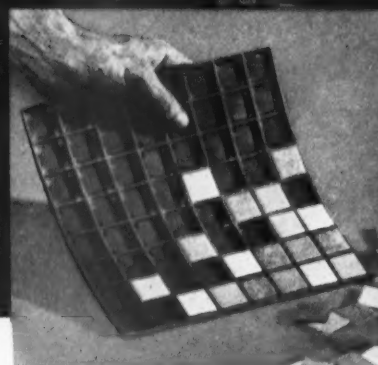
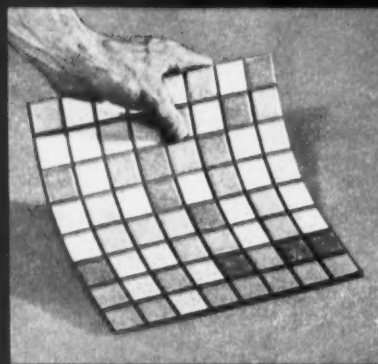


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DIMENSIONS. Ceramaflex flooring units are 9" x 9" squares...and 1/2" thick. Each Ceramaflex floor unit is composed of 64 ceramic mosaic tiles approximately 1" x 1".

FINISH. The surface of Ceramaflex is sealed at the plant with a protective coating to prevent wearing-in of dirt and grime.

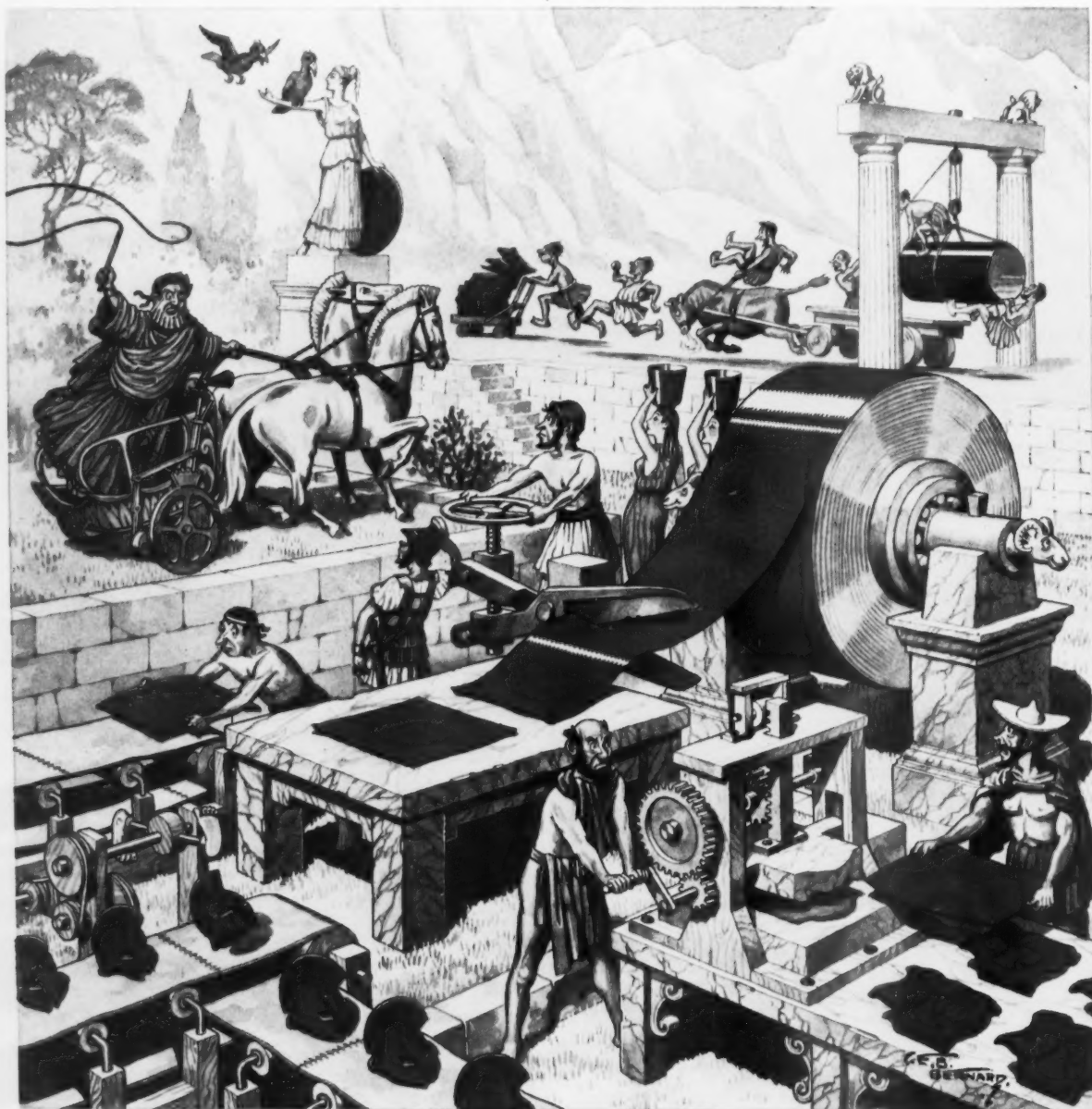
COLORS. Random medley patterns in twelve handsome color combinations.

Now it can be told

This engraved marble tablet recently uncovered in one of the long-lost Phrygian caves shows how Midas fooled the public. This stuff wasn't 14-karat at

all. The "Midas Touch" is nothing but a myth. Midas used ColorRold* Stainless Steel, developed by Washington Steel Corporation. Gotta give the old charlatan a lot of credit though—he knew a good thing when he saw it.

MIDAS SPECS: 2 cubits \times .025" \pm .001" \times coil, Type CCCII (302), Rb 82 max, Sun-brite gold, 50 glossimeter, 1 mil, paper interleaved, skidded for open oxcart only. 12 \times 10⁶ drachma max. wt. per coil.



*ColorRold, an organic coated stainless steel, comes in eleven harmonizing colors, can be formed and drawn or textured and highlighted in an infinite number of designs and effects, now available for your architectural or product needs.

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